APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY	
APPLICATION #:	OSP – 0385 – 10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☒ New ☐ Renewal

Manufacturer Information

Manufacturer: Johnson Controls, Inc.

Manufacturer's Technical Representative: Timothy W. Irvin, Manager – Airside Commercial Application Support

Mailing Address: 631 S. Richland Avenue, Door 100 – MC 362A-D, York, PA 17403

Telephone: (414) 524-6211 Email: Timothy.w.irvin@jci.com

Product Information

Product Name: Blower Coils: ACB, ACR, AHI, AHM, AVI, AVM

Product Type: Mechanical equipment

Product Model Number: See Attachment
(List all unique product identification numbers and/or part numbers)

General Description: Blower coil units containing coils, fans, motors, filters, dampers, electric heat and controls. Seismic enhancements made to the test units required to address the anomalies observed during the tests shall be incorporated into the production units.

Mounting Description: Rigid base mount (ACB, ACR, AVI/AVM and AHI/AHM); ceiling suspended (AHI/AHM)

Applicant Information

Applicant Company Name: DYNAMIC CERTIFICATION LABORATORIES

Contact Person: JOSEPH L. LABRIE, S.E., MANAGING PARTNER

Mailing Address: 1315 GREG STREET, SUITE 109, SPARKS, NV 89431

Telephone: (775) 358-5085 Email: LABRIE@MAKEITRIGHT.NET

I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2013.

Signature of Applicant: _____ Date: 3/10/14

Title: MANAGING PARTNER Company Name: DYNAMIC CERTIFICATION LABORATORIES

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

Company Name: DYNAMIC CERTIFICATION LABORATORIES

Name: DR. AHMAD ITANI, S.E. California License Number: SE-5220

Mailing Address: 1315 GREG STREET, SUITE 109, SPARKS, NV 89431

Telephone: (775) 358-5085 Email: ITANI@SHAKETEST.COM

Supports and Attachments Preapproval

☐ Supports and attachments are preapproved under OPM- _____
(Separate application for OSHPD Preapproval of Manufacturer's Certification (OPM) of Supports and attachments is required)

☒ Supports and attachments are not preapproved

Certification Method

☒ Testing in accordance with: ☒ ICC-ES AC156

☐ Other (Please Specify): _____

Testing Laboratory

Company Name: DYNAMIC CERTIFICATION LABORATORIES

Contact Name: AUSTIN BROWN, P.E., LABORATORY MANAGER

Mailing Address: 1315 GREG STREET, SUITE 109, SPARKS, NV 89431

Telephone: (775) 358-5085 Email: AUSTIN@SHAKETEST.COM

Seismic Parameters

Design in accordance with ASCE 7-10 Chapter 13: ☒ Yes ☐ No

Design Basis of Equipment or Components (F_p/W_p) = 1.44 (S_{DS} 1.92); 1.45 (S_{DS} 1.93); 1.50 (S_{DS} 2.00)

S_{DS} (Design spectral response acceleration at short period, g) = 1.92 (ACB, ACR); 1.93 (AVI, AHI); 2.00 (AHM)

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

R_p (Equipment or component response modification factor) = 6.0

Ω_0 (System overstrength factor) = 2.5

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1.0

Equipment or Component Natural Frequencies (Hz) = See attachments

Overall dimensions and weight (or range thereof) = See attachments

Equipment or Components @ grade designed in accordance with ASCE 7-10 Chapter 15: ☐ Yes ☒ No

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

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

S_{D1} (Design spectral response acceleration at 1 second period, g) = _____

R (Response modification coefficient) = _____

Ω_0 (System overstrength factor) = _____

C_d (Deflection amplification factor) = _____

I_p (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, 2010: ☐ Yes ☒ No

List of Attachments Supporting Special Seismic Certification

☒ Test Report(s) ☒ Drawings ☐ Calculations ☒ Manufacturer's Catalog

☐ Other(s) (Please Specify): _____

OSHPD Approval (For Office Use Only) – Approval Expires on December 31, 2019

Signature: _____ Date: 3/12/2014

Print Name: M. R. Karim Title: SHFR

Special Seismic Certification Valid Up to : S_{DS} (g) = See Above z/h = 1.0

Condition of Approval (if applicable): _____

Special Seismic Certification
Certified Components - Blower Coils

DCL Dynamic Certification Laboratories

Manufacturer: Johnson Controls

Product Family: Blower Coils

Certified Product Construction:

18 gage galvanized steel cabinet construction with 1/2" thick fiberglass insulation.

Certified Mounting Description:

ACB and ACR are rigid base mounted

Product Family	Enviro-Tec Model Number	JCI Model Number	Dimensions (in)						Max. Weight (lb)	Mounting	Sds (g), z/h=1	UUT
			Base Unit Length	Additional Length w/ Inlet Damper	Width	Base Unit Height	Additional Height w/ Electric Heat	Additional Height w/ Return Plenum				
Blower Coils, ACB (Bottom Return)	VB 08	ACB 08	19	N/A	26	51	22	16	300	Rigid base mount	1.92	UUT1
	VB 12	ACB 12	21	N/A	26	51	22	16	300 - 600			Interpolated
	VB 16	ACB 16	25	N/A	29	59	22	16				Interpolated
	VB 20	ACB 20	28	N/A	29	59	22	16				Interpolated
	VB 25	ACB 25	28	N/A	39	65	22	16				Interpolated
	VB 30	ACB 30	28	N/A	39	65	22	16				Interpolated
Blower Coils, ACR (Rear Return)	VR 08	ACR 08	23	14.5	26	47	22	N/A	300 - 600		1.92	Interpolated
	VR 12	ACR 12	25	17.5	26	47	22	N/A				Interpolated
	VR 16	ACR 16	29	17.5	29	55	22	N/A				Interpolated
	VR 20	ACR 20	32	20.5	29	55	22	N/A				Interpolated
	VR 25	ACR 25	32	20.5	39	61	22	N/A				Interpolated
	VR 30	ACR 30	32	20.5	39	61	22	N/A	600			UUT2

Special Seismic Certification
Certified Components - Blower Coils

DCL Dynamic Certification Laboratories

Manufacturer: Johnson Controls

Product Family: Blower Coils

Certified Product Construction:

18 gage galvanized steel cabinet construction; 1" thick foil faced fiberglass insulation.

Certified Mounting Description:

AVI, AVM, AHI, AHM are rigid base mounted. AHI/AHM can also be ceiling suspended.

Product Family	Enviro-Tec Model Number	JCI Model Number	Cabinet Dimensions (in)				Standard Mixing Box Dimensions (in)			Max. Weight (lb)	Mounting	Sds (g), z/h=1	UUT
			Length	Additional Length w/ Electric Heat Module	Width	Height	Max Length	Width	Height				
Blower Coils, AVI / AVM*	V/VM 08	AVI/AVM 08	28 1/2	22	30	45	19	30	22	380	Rigid base mount	1.93	UUT3
	V/VM 12	AVI/AVM 12	28 1/2	22	36	45	19	36	22	380 - 950			Interpolated
	V/VM 16	AVI/AVM 16	28 1/2	22	44	45	19	44	22				Interpolated
	V/VM 20	AVI/AVM 20	34 1/2	22	50	51	22	50	22				Interpolated
	V/VM 30	AVI/AVM 30	34 1/2	22	59	57	22	59	31				Interpolated
	V/VM 40	AVI/AVM 40	34 1/2	22	68	60	24	68	31	950			UUT4
Blower Coils, AHI / AHM*	H/HM 08	AHI/AHM 08	52 1/2	22	30	21	19	30	22	390	Rigid base mount	2.00	UUT31
	H/HM 12	AHI/AHM 12	52 1/2	22	36	21	19	36	22	390 - 970			Interpolated
	H/HM 16	AHI/AHM 16	52 1/2	22	44	21	19	44	22				Interpolated
	H/HM 20	AHI/AHM 20	52 1/2	22	50	21	22	50	22				Interpolated
	H/HM 30	AHI/AHM 30	58 1/2	22	59	30	22	59	31				Interpolated
	H/HM 40	AHI/AHM 40	58 1/2	22	68	30	24	68	31	970			UUT32
Blower Coils, AHI / AHM*	H/HM 08	AHI/AHM 08	52 1/2	22	30	21	19	30	22	390	Ceiling Suspended	1.93	UUT27
	H/HM 12	AHI/AHM 12	52 1/2	22	36	21	19	36	22	390 - 970			Interpolated
	H/HM 16	AHI/AHM 16	52 1/2	22	44	21	19	44	22				Interpolated
	H/HM 20	AHI/AHM 20	52 1/2	22	50	21	22	50	22				Interpolated
	H/HM 30	AHI/AHM 30	58 1/2	22	59	30	22	59	31				Interpolated
	H/HM 40	AHI/AHM 40	58 1/2	22	68	30	24	68	31	970			UUT28

*M designates the presence of a mixing box

Special Seismic Certification
Certified Subcomponents

DCL Dynamic Certification Laboratories

Manufacturer: Johnson Controls, Inc.

Product Line: Blower Coils

Certified Subcomponent: Coils

Coils (V/AVI, VM/AVM) - Rigid Base-Mounted Units									
Unit Size	Manufacturer	Dimensions (in)		Max Row Qty (Heat)	Max Row Qty (Cool)	Number of Coils, Stacked	Weight (lb)	Sds (g), z/h=1	Unit
		Height	Width						
8	JCI	16	30	2	6	1	12	1.93	UUT3
12 - 30	JCI	16 to 25	30 to 68	2	6	1	12 to 178		Interpolated
40	JCI	25	68	2	6	1	178		UUT4

Coil Variables

1. Fin Material: Aluminum
2. Coil Casing: Galvanized Carbon Steel
3. Fin Shape: Corrugated
4. Tube diameter: 0.5"
5. Tube thickness: 0.016", 0.025"
6. Fins Per Inch: 12

Coils (H/AHI, HM/AHM) - Ceiling Suspended Units									
Unit Size	Manufacturer	Dimensions (in)		Max Row Qty (Heat)	Max Row Qty (Cool)	Number of Coils, Stacked	Weight (lb)	Sds (g), z/h=1	Unit
		Height	Width						
8	JCI	16	30	2	6	1	12	1.93	UUT27
12 - 30	JCI	16 to 25	30 to 68	2	6	1	12 to 178		Interpolated
40	JCI	25	68	2	6	1	178		UUT28

Coil Variables

1. Fin Material: Aluminum
2. Coil Casing: Galvanized Carbon Steel
3. Fin Shape: Corrugated
4. Tube diameter: 0.5"
5. Tube thickness: 0.016", 0.025"
6. Fins Per Inch: 12

Special Seismic Certification
Certified Subcomponents

DCL Dynamic Certification Laboratories

Manufacturer: Johnson Controls, Inc.

Product Line: Blower Coils

Certified Subcomponent: Coils

Coils (H/AHI, HM/AHM) - Rigid Base-Mounted Units									
Unit Size	Manufacturer	Dimensions (in)		Max Row Qty (Heat)	Max Row Qty (Cool)	Number of Coils, Stacked	Weight (lb)	Sds (g), z/h=1	Unit
		Height	Width						
8	JCI	16	30	2	6	1	12	2.0	UUT31
12 - 30	JCI	16 to 25	30 to 68	2	6	1	12 to 178		Interpolated
40	JCI	25	68	2	6	1	178		UUT32

Coil Variables

1. Fin Material: Aluminum
2. Coil Casing: Galvanized Carbon Steel
3. Fin Shape: Corrugated
4. Tube diameter: 0.5"
5. Tube thickness: 0.016", 0.025"
6. Fins Per Inch: 12

Coils (VB/ACB and VR/ACR) - Rigid Base-Mounted Units									
Unit Size	Manufacturer	Dimensions (in)		Row Qty (Water)	Row Qty (Steam)	Number of Coils, Stacked	Weight (lb)	Sds (g), z/h=1	Unit
		Height	Width						
8	JCI	18.25	13.125	4	1	1	12	1.92	UUT 1
12 - 25	JCI	18.25	13.125 to 41.25	4 to 6	1 or 2	1	12 to 146		Interpolated
30	JCI	18.25	41.25	6	2	1	146		UUT 2

Coil Variables

1. Fin Material: Aluminum
2. Coil Casing: Galvanized Carbon Steel
3. Fin Shape: Corrugated
4. Tube diameter: 0.5"
5. Tube thickness: 0.016", 0.025"
6. Fins Per Inch: 8 - 14

Special Seismic Certification
Certified Subcomponents

DCL Dynamic Certification Laboratories

Manufacturer: Johnson Controls, Inc.

Product Line: Blower Coils

Certified Subcomponent: Fans

Fans (V/AVI, VM/AVM) - Rigid Base-Mounted Units										
Unit Size	Manufacturer	Shaft material	Blade Material	Fan Width (in)	Type	Number of Fans	Fan Wheel Diam. (in)	Weight (lb)	Sds (g), z/h=1	Unit
8	Morrison	Stainless steel	Galvanized carbon steel	8.25	DWDI, Forward Curve	1	9	27	1.93	UUT3
12 - 30				8.25 to 14.5		1	9 - 13	27 - 39		Interpolated
40				14.5		1	13	39		UUT4

Fans (H/AHI, HM/AHM) - Ceiling Suspended Units										
Unit Size	Manufacturer	Shaft material	Blade Material	Fan Width (in)	Type	Number of Fans	Fan Wheel Diam. (in)	Weight (lb)	Sds (g), z/h=1	Unit
8	Morrison	Stainless steel	Galvanized carbon steel	8.25	DWDI, Forward Curve	1	9	27	1.93	UUT 27
12 - 30				8.25 to 14.5		1	9 - 13	27 - 39		Interpolated
40				14.5		1	13	39		UUT 28

Fans (H/AHI, HM/AHM) - Rigid Base-Mounted Units										
Unit Size	Manufacturer	Shaft material	Blade Material	Fan Width (in)	Type	Number of Fans	Fan Wheel Diam. (in)	Weight (lb)	Sds (g), z/h=1	Unit
8	Morrison	Stainless steel	Galvanized carbon steel	8.25	DWDI, Forward Curve	1	9	27	2.00	UUT 31
12 - 30				8.25 to 14.5		1	9 - 13	27 - 39		Interpolated
40				14.5		1	13	39		UUT 32

Fans (VB/ACB and VR/ACR) - Rigid Base-Mounted Units										
Unit Size	Manufacturer	Shaft material	Blade Material	Fan Width (in)	Type	Number of Fans	Fan Wheel Diam. (in)	Weight (lb)	Sds (g), z/h=1	Unit
8	Revcor	Stainless steel	Galvanized carbon steel	8.25	DWDI, Forward Curve	1	9	10	1.92	UUT 1
12 - 25				8.25 to 13.25		1	9	10 - 17		Interpolated
30				13.25		1	9	17		UUT 2

Special Seismic Certification
Certified Subcomponents

DCL Dynamic Certification Laboratories

Manufacturer: Johnson Controls, Inc.

Product Line: Blower Coils

Certified Subcomponent: Motors

Fan Motors (V/AVI, VM/AVM) - Rigid Base-Mounted Units

Unit Size	Manufacturer	Drive	Tested Voltage	Certified Voltage	HP	Material	Sds (g), z/h=1	Unit
8	Weg	Belt	208	115/208-230 or 460	1	Powder-coated carbon steel	1.93	UUT3
12 - 30		Belt	n/a		3/4 to 5	Powder-coated carbon steel		Interpolated
40		Belt	460		5	Powder-coated carbon steel		UUT4

Fan Motors (H/AHI, HM/AHM) - Ceiling Suspended Units

Unit Size	Manufacturer	Drive	Tested Voltage	Certified Voltage	HP	Material	Sds (g), z/h=1	Unit
8	Weg	Belt	208	115/208-230 or 460	1	Powder-coated carbon steel	1.93	UUT27
12 - 30		Belt	n/a		3/4 to 5	Powder-coated carbon steel		Interpolated
40		Belt	460		5	Powder-coated carbon steel		UUT28

Fan Motors (H/AHI, HM/AHM) - Rigid Base-Mounted Units

Unit Size	Manufacturer	Drive	Tested Voltage	Certified Voltage	HP	Material	Sds (g), z/h=1	Unit
8	Weg	Belt	208	115/208-230 or 460	3/4	Powder-coated carbon steel	2.0	UUT31
8		Belt	208		1	Powder-coated carbon steel		Interpolated
12 - 30		Belt	n/a		3/4 to 5	Powder-coated carbon steel		Interpolated
40		Belt	460		5	Powder-coated carbon steel		UUT32

Fan Motors (VB/ACB and VR/ACR) - Rigid Base-Mounted Units

Unit Size	Manufacturer	Drive	Tested Voltage	Certified Voltage	HP	Material	Sds (g), z/h=1	Unit
8	Weg	Belt	208	115/208-230 or 460	1	Powder-coated carbon steel	1.92	UUT1
12 - 25		Belt	n/a		1 to 1 1/2	Powder-coated carbon steel		Interpolated
30		Belt	460		1 1/2	Powder-coated carbon steel		UUT2

Special Seismic Certification
Certified Subcomponents

DCL Dynamic Certification Laboratories

Manufacturer: Johnson Controls, Inc.

Product Line: Blower Coils

Certified Subcomponent: Filters

Filters (V/AVI, VM/AVM) - Rigid Base-Mounted Units									
Unit Size	Manufacturer	Type	Material	Qty	Height (in)	Width (in)	Filter Face Area (sq. ft)	Sds (g), z/h=1	Unit
8	AAF	2" Throwaway	Cotton-based fiber	1	16	20	2.2	1.93	UUT3
12	AAF	2" Throwaway		1	16	25	2.8		Interpolated
16	AAF	2" Throwaway		2	16	20	4.4		Interpolated
20	AAF	2" Throwaway		1	16	20	5.0		Interpolated
		2" Throwaway		1	16	25			
30	AAF	2" Throwaway		2	16	25	9.0		Interpolated
		2" Throwaway		1	20	25			
40	AAF	2" Throwaway		3	20	25	10.4		UUT4

Filters (H/AHI, HM/AHM) - Ceiling Suspended Units									
Unit Size	Manufacturer	Type	Material	Qty	Height (in)	Width (in)	Filter Face Area (sq. ft)	Sds (g), z/h=1	Unit
8	AAF	2" Throwaway	Cotton-based fiber	1	16	20	2.2	1.93	UUT27
12	AAF	2" Throwaway		1	16	25	2.8		Interpolated
16	AAF	2" Throwaway		2	16	20	4.4		Interpolated
20	AAF	2" Throwaway		1	16	20	5.0		Interpolated
		2" Throwaway		1	16	25			
30	AAF	2" Throwaway		2	16	25	9.0		Interpolated
		2" Throwaway		1	20	25			
40	AAF	2" Throwaway		3	20	25	10.4		UUT28

Special Seismic Certification
Certified Subcomponents

DCL Dynamic Certification Laboratories

Manufacturer: Johnson Controls, Inc.

Product Line: Blower Coils

Certified Subcomponent: Filters

Filters (H/AHI, HM/AHM) - Rigid Base-Mounted Units									
Unit Size	Manufacturer	Type	Material	Qty	Height (in)	Width (in)	Filter Face Area (sq. ft)	Sds (g), z/h=1	Unit
8	AAF	2" Throwaway	Cotton-based fiber	1	16	20	2.2	2.0	UUT31
12	AAF	2" Throwaway		1	16	25	2.8		Interpolated
16	AAF	2" Throwaway		2	16	20	4.4		Interpolated
20	AAF	2" Throwaway		1	16	20	5.0		Interpolated
		2" Throwaway		1	16	25			
30	AAF	2" Throwaway		2	16	25	9.0		Interpolated
		2" Throwaway		1	20	25			
40	AAF	2" Throwaway		3	20	25	10.4		UUT32

Filters (VB/ACB and VR/ACR) - Rigid Base-Mounted Units									
Unit Size	Manufacturer	Type	Material	Qty	Height (in)	Width (in)	Filter Face Area (sq. ft)	Sds (g), z/h=1	Unit
8	AAF	2" Throwaway	Cotton-based fiber	1	16	20	2.2	1.92	UUT1
12	AAF	2" Throwaway		1	20	20	2.8		Interpolated
16	AAF	2" Throwaway		1	24	24	4.0		Interpolated
20	AAF	2" Throwaway		1	24	24	4.0		Interpolated
25	AAF	2" Throwaway		1	24	24	6.0		Interpolated
				1	12	24			
30	AAF	2" Throwaway		1	24	24	6.0		UUT2
				1	12	24			

Special Seismic Certification
Certified Subcomponents

DCL Dynamic Certification Laboratories

Manufacturer: Johnson Controls, Inc.

Product Line: Blower Coils

Certified Subcomponent: Dampers

Dampers (V/AVI, VM/AVM) - Rigid Base-Mounted Units								
Unit Size	Manufacturer	Construction	Qty	Height (in)	Width (in)	Weight (lb)	Sds (g), z/h=1	Unit
8	JCI	14 gauge, galvanized steel	2	9	18	10	1.93	UUT3
12			2	9	24	10 to 15		Interpolated
16			2	9	30			Interpolated
20			2	12	36			Interpolated
30			2	12	45			Interpolated
40			2	15	48	15		UUT4

Dampers (H/AHI, HM/AHM) - Ceiling Suspended Units								
Unit Size	Manufacturer	Construction	Qty	Height (in)	Width (in)	Weight (lb)	Sds (g), z/h=1	Unit
8	JCI	14 gauge, galvanized steel	2	9	18	10	1.93	UUT27
12			2	9	24	10 to 15		Interpolated
16			2	9	30			Interpolated
20			2	12	36			Interpolated
30			2	12	45			Interpolated
40			2	15	48	15		UUT28

Dampers (H/AHI, HM/AHM) - Rigid Base-Mounted Units								
Unit Size	Manufacturer	Construction	Qty	Height (in)	Width (in)	Weight (lb)	Sds (g), z/h=1	Unit
8	JCI	14 gauge, galvanized steel	2	9	18	10	2.0	UUT31
12			2	9	24	10 to 15		Interpolated
16			2	9	30			Interpolated
20			2	12	36			Interpolated
30			2	12	45			Interpolated
40			2	15	48	15		UUT32

Special Seismic Certification
Certified Subcomponents

DCL Dynamic Certification Laboratories

Manufacturer: Johnson Controls, Inc.

Product Line: Blower Coils

Certified Subcomponent: Dampers

Dampers (VB/ACB and VR/ACR) - Rigid Base-Mounted Units								
Model #	Manufacturer	Construction	Qty	Height (in)	Width (in)	Weight (lb)	Sds (g), z/h=1	Unit
8	JCI	14 gauge, galvanized steel	2	6	22	10	1.92	UUT1
12			2	9	22	10 to 15		Interpolated
16			2	9	25			Interpolated
20			2	12	25			Interpolated
25			2	12	35			Interpolated
30			2	12	35	15		UUT2

Special Seismic Certification
Certified Subcomponents

DCL Dynamic Certification Laboratories

Manufacturer: Johnson Controls, Inc.

Product Line: Blower Coils

Certified Subcomponent: Electric Heat

Electric Heat (V/AVI, VM/AVM) - Rigid Base-Mounted Units							
Unit Size	Manufacturer	Construction	Qty	kW Output	Voltage	Sds (g), z/h=1	Test Unit
8	JCI	Stainless steel frame, galvanized steel plates, internal wiring rated at 105°C	1	5	208	1.93	UUT3
12 - 30			1	5 - 26	208 - 460		Interpolated
40			1	26	460		UUT4

Electric Heat (H/AHI, HM/AHM) - Ceiling Suspended Units							
Unit Size	Manufacturer	Construction	Qty	kW Output	Voltage	Sds (g), z/h=1	Test Unit
8	JCI	Stainless steel frame, galvanized steel plates, internal wiring rated at 105°C	1	5	208	1.93	UUT27
12 - 30			1	5 - 26	208 - 460		Interpolated
40			1	26	460		UUT28

Electric Heat (H/AHI, HM/AHM) - Rigid Base-Mounted Units							
Unit Size	Manufacturer	Construction	Qty	kW Output	Voltage	Sds (g), z/h=1	Test Unit
8	JCI	Stainless steel frame, galvanized steel plates, internal wiring rated at 105°C	1	5	208	2	UUT31
12 - 30			1	5 - 26	208 - 460		Interpolated
40			1	26	460		UUT32

Electric Heat (VB/ACB and VR/ACR) - Rigid Base-Mounted Units							
Unit Size	Manufacturer	Construction	Qty	kW Output	Voltage	Sds (g), z/h=1	Test Unit
8	JCI	Stainless steel frame, galvanized steel plates, internal wiring rated at 105°C	1	5	208	1.92	UUT 1
12 - 25			1	5 - 18	208 - 460		Interpolated
30			1	18	460		UUT 2

Special Seismic Certification
Certified Subcomponents

DCL Dynamic Certification Laboratories

Manufacturer: Johnson Controls, Inc.

Product Line: Blower Coils

Certified Subcomponent: Controls

Controls					
Model	Manufacturer	Description	Material	Sds (g), z/h=1	Unit
DFS-221-198	Cleveland Controls	Airflow Switch	Stainless steel housing	2.0	UUT31, UUT32
PE-01-0025	Square D	Switch,3POS, CAM 480V 10A KS46B	Plastic cover	2.0	UUT31, UUT32
PE-01-0026	Square D	Switch, NONC CONTACT KA1	Plastic cover	2.0	UUT31, UUT32
OT40	ABB	Disconnect switch, 3P 40A 600V	Plastic cover	1.92	UUT1, UUT2, UUT31
OT80	ABB	Disconnect switch, 3P 80A 600V	Plastic cover	1.93	UUT4, UUT28, UUT32
PE-03-3091	Sprecher & Schuh	Starter, 9A 3POLE 24V	Plastic cover	1.93	UUT4, UUT28, UUT32
PE-05-1501	Hartland	Contactor, 1P 50A 24VAC 9VA 1HP	Silver cadmium oxide contacts	1.93	UUT4, UUT28, UUT32
PE-05-3351	Hartland	Contactor, 3P 35A 24VAC 11VA 5HP	Silver cadmium oxide contacts	1.93	UUT2, UUT4, UUT28, UUT32
PE-10-6107	Hartland	Transformer (208/240)/24VAC 75VA	130deg C Class B insulation	1.93	UUT3, UUT31
PE-10-7107	Hartland	Transformer 480/24VAC 75VA	130deg C Class B insulation	1.93	UUT4, UUT28, UUT32
PH-05-0012	Honeywell	2 1/2 Pitot tube	Stainless steel	2.0	UUT31, UUT32

Special Seismic Certification
Tested Components - Blower Coils

DCL Dynamic Certification Laboratories

Manufacturer: Johnson Controls

Product Family: Blower Coils

Tested Product Construction:

18 gage galvanized steel cabinet construction.

Tested Mounting Description:

ACB, ACR, AVM and AHM are rigid base mounted; AHM are also ceiling suspended

Model	Dimensions (in)									Weight (lb)	Mounting	Sds (g), z/h=1	Unit
	Main Cabinet			Electric Heat Module			Standard Mixing Box						
	Length	Width	Height	Length	Width	Height	Length	Width	Height				
ACB 08	19	26	67*	18 7/8	26	22	N/A	N/A	N/A	300	Rigid base mount	1.93	UUT1
ACR 30	52.5*	39	61	25 5/8	39	22	N/A	N/A	N/A	600		1.92	UUT2
AVM 08	28 1/2	30	45	22	8 7/8	11 7/8	19	30	22	380		2.50	UUT3
AVM 40	34 1/2	68	60	22	15 5/8	16 5/8	24	68	31	950		1.93	UUT4
AHM 08	52 1/2	30	21	22	8 7/8	11 7/8	19	30	22	390	Ceiling Suspended	1.93	UUT27
AHM 40	58 1/2	68	30	22	15 5/8	16 5/8	24	68	31	970		1.93	UUT28
AHM 08	52 1/2	30	21	22	8 7/8	11 7/8	19	30	22	390	Rigid base mount	2.50	UUT31
AHM 40	58 1/2	68	30	22	15 5/8	16 5/8	24	68	31	970		2.00	UUT32

*UUT1, height includes 16" for return plenum. UUT2, length includes 20.5" for inlet damper.

UUT1 Unit Under Test Summary Sheet

DCL Dynamic Certification Laboratories

Manufacturer: Johnson Controls Incorporated

Product Line: Commercial Product Line

Model Number: ACB 08

Options: Coils (4 row cold water, 1 row steam), 9" diameter fan, 208V 1HP fan motor, 2" throwaway filter, dampers, 5kW electric heat, switches, transformer and pitot tube

Cabinet Construction Summary

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

Electrical Enclosure: Standard 18 gauge galvanized steel enclosure with hinged door

Dampers : (qty = 2) 6"H x 22"W, 14 gauge galvanized steel

Doors: None

SDS Level Passed: 1.93 g (z/h = 1.0, Ip = 1.5)

	Lowest Natural Frequency			Operating Weight (lbs)
	F-B (Hz)	S-S (Hz)	V (Hz)	
Cabinet	6.9	7.6	12.3	300

Component Summary

Item	Dimensions			
	Length (in)	Width (in)	Height (in)	Weight (lbs)
Main Cabinet	19	26	67*	NA
Electric Heat Module	18 7/8	26	22	NA

***Height includes 16" for return plenum**

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.

Unit was rigid base mounted to the shake table interface fixture with 1/2-inch threaded rod at each of the four corners. A 2-foot tall, 9-inch by 12-inch 20-gage sheet metal duct was attached to the ducted discharge on top of the electric heater with eight #10 sheet metal screws (two on each side, seven inches apart on the short side, 10-inches apart on the long side). The sheet metal duct was attached to the DCL fixture frame with four #14 sheet metal screws (two each on the front and back, spaced 1-inch from the corners).

UUT2 Unit Under Test Summary Sheet

DCL Dynamic Certification Laboratories

Manufacturer: Johnson Controls Incorporated

Product Line: Commercial Product Line

Model Number: ACR 30

Options: Coils (6 row cold water, 2 row steam), 9" diameter fan, 460V 1.5HP fan motor, 2" throwaway filters, dampers, 18kW electric heat, switches, transformer and pitot tube

Cabinet Construction Summary

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

Electrical Enclosure: Standard 18 gauge galvanized steel enclosure with hinged door

Dampers : (qty=2) 12"H x 35"W, 14 gauge galvanized steel

Doors: None

SDS Level Passed: 1.92 g (z/h = 1.0, Ip = 1.5)

	Lowest Natural Frequency			Operating Weight (lbs)
	F-B (Hz)	S-S (Hz)	V (Hz)	
Cabinet	8.7	8.2	17.5	600

Component Summary

Item	Dimensions			
	Length (in)	Width (in)	Height (in)	Weight (lbs)
Main Cabinet	52 1/2*	39	61	NA
Electric Heat Module	25 5/8	39	22	NA

***Length includes 20.5" for inlet damper**

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.

Unit was rigid base mounted to the shake table interface fixture with 1/2-inch threaded rod at each of the four corners. A 2-foot tall, 16-inch by 17-inch 20-gage sheet metal duct was attached to the ducted discharge on top of the electric heater with eight #10 sheet metal screws (two on each side, seven inches apart on the short side, 10-inches apart on the long side). The sheet metal duct was attached to the DCL fixture frame with four #14 sheet metal screws (two each on the front and back, spaced 1-inch from the corners).

UUT3 Unit Under Test Summary Sheet

((●)) DCL Dynamic Certification Laboratories

Manufacturer: Johnson Controls Incorporated

Product Line: Commercial Product Line

Model Number: AVM 08

Options: Coils (2 row heating, 6 row cooling), 9" diameter fan, 208V 1HP fan motor, 2" throwaway filter, dampers, 5kW electric heat, switches, transformer and pitot tube

Cabinet Construction Summary

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

Electrical Enclosure: Standard 18 gauge galvanized steel enclosure with hinged door

Dampers : (qty=2) 9"H x 18"W, 14 gauge galvanized steel

Doors: None

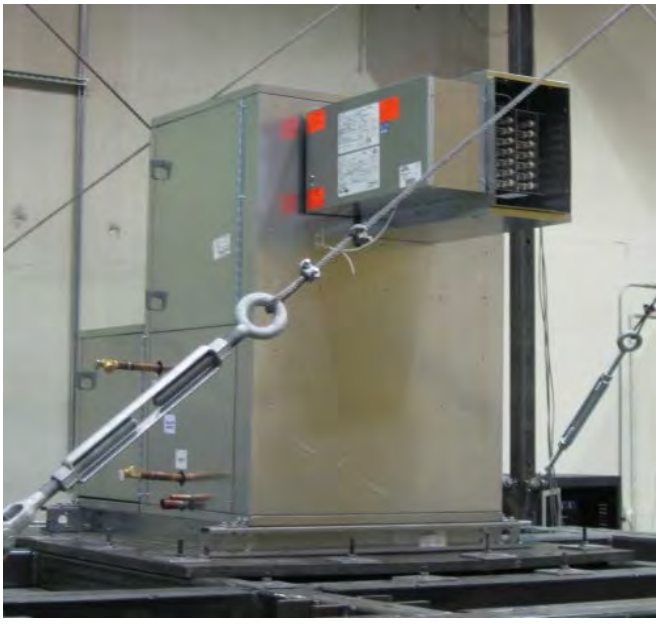
SDS Level Passed: 2.5 g (z/h = 1.0, Ip = 1.5)

	Lowest Natural Frequency			Operating Weight (lbs)
	F-B (Hz)	S-S (Hz)	V (Hz)	
Cabinet	10.9	11.9	16.5	380

Component Summary

Item	Dimensions			
	Length (in)	Width (in)	Height (in)	Weight (lbs)
Main Cabinet	28 1/2	30	45	NA
Electric Heat Module	22	8 7/8	11 7/8	NA
Standard Mixing Box	19	30	22	NA

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.



Unit was rigid base mounted to the shake table interface fixture with 1/2-inch threaded rod at each of the four corners.

UUT4 Unit Under Test Summary Sheet

DCL Dynamic Certification Laboratories

Manufacturer: Johnson Controls Incorporated

Product Line: Commercial Product Line

Model Number: AVM 40

Options: Coils (2 row heating, 6 row cooling), 13" diameter fan, 460V 5HP fan motor, 2" throwaway filters, dampers, 26kW electric heat, switches, transformer and pitot tube

Cabinet Construction Summary

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

Electrical Enclosure: Standard 18 gauge galvanized steel enclosure with hinged door

Dampers : (qty=2) 15"H x 48"W, 14 gauge galvanized steel

Doors: None

SDS Level Passed: 1.93 g (z/h = 1.0, Ip = 1.5)

	Lowest Natural Frequency			Operating Weight (lbs)
	F-B (Hz)	S-S (Hz)	V (Hz)	
Cabinet	6.1	12.1	12	950

Component Summary

Item	Dimensions			
	Length (in)	Width (in)	Height (in)	Weight (lbs)
Main Cabinet	34 1/2	68	60	NA
Electric Heat Module	22	15 5/8	16 5/8	NA
Standard Mixing Box	24	68	31	NA

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.

Unit was rigid base mounted to the shake table interface fixture with 1/2-inch threaded rod at each of the four corners.

UUT27 Unit Under Test Summary Sheet

((●)) DCL Dynamic Certification Laboratories

Manufacturer: Johnson Controls Incorporated

Product Line: Commercial Product Line

Model Number: AHM 08

Options: Coils (2 row heating coils, 6 row cooling coils), 9" diameter fan, 208V 1HP fan motor, 2" throwaway filter, dampers and 5kW electric heat

Cabinet Construction Summary
Panel Construction: 18 Gauge Galvanized Steel (exterior), Fiberglass (interior)
Electrical Enclosure: Standard 18 gauge galvanized steel enclosure with hinged door
Dampers : (qty=2) 9"H x 18"W, 14 gauge galvanized steel
Doors: None
SDS Level Passed: 1.93 g (z/h = 1.0, Ip = 1.5)

	Lowest Natural Frequency			Operating Weight (lb)
	F-B (Hz)	S-S (Hz)	V (Hz)	
Cabinet	N/A	N/A	N/A	390

Component Summary

Item	Dimensions			
	Length (in)	Width (in)	Height (in)	Weight (lb)
Main Cabinet	52 1/2	30	21	NA
Electric Heat Module	22	8 7/8	11 7/8	NA
Standard Mixing Box	19	30	22	NA

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.

Unit was ceiling suspended using strut screwed to the top and bottom of the unit (front and back) using #12 sheet metal screws, spaced approximatley 6-inches on center. On the top of each of the four corners, (4) 90 deg. 16 gage galvanized steel brackets were attached on the side and 4 flat 16 gage galvanized steel brackets on the top of each corner. 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 B-line 1/2-inch clips, spaced no more than 22 inches on center. 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).

UUT28 Unit Under Test Summary Sheet

((●)) DCL Dynamic Certification Laboratories

Manufacturer: Johnson Controls Incorporated

Product Line: Commercial Product Line

Model Number: AHM 40

Options: Coils (2 row heating, 6 row cooling), 13" diameter fan, 460V 5HP fan motor, 2" throwaway filters, dampers, 26kW electric heat, switches, transformer and pitot tube

Cabinet Construction Summary
Panel Construction: 18 Gauge Galvanized Steel (exterior), Fiberglass (interior)
Electrical Enclosure: Standard 18 gauge galvanized steel enclosure with hinged door
Dampers : (qty=2) 15"H x 48"W, 14 gauge galvanized steel
Doors: None
SDS Level Passed: 1.93 g (z/h = 1.0, Ip = 1.5)

	Lowest Natural Frequency			Operating Weight (lb)
	F-B (Hz)	S-S (Hz)	V (Hz)	
Cabinet	N/A	N/A	N/A	970

Component Summary

Item	Dimensions			
	Length (in)	Width (in)	Height (in)	Weight (lb)
Main Cabinet	58 1/2	68	30	NA
Electric Heat Module	22	15 5/8	16 5/8	NA
Standard Mixing Box	24	68	31	NA

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.

UUT28 Unit Under Test Summary Sheet (Continued)

DCL Dynamic Certification Laboratories

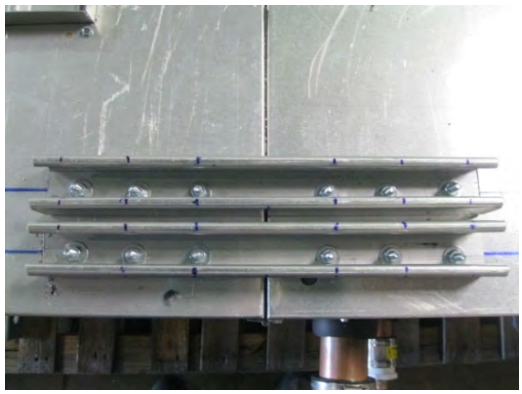
Manufacturer: Johnson Controls Incorporated

Product Line: Commercial Product Line

Model Number: AHM 40

Seismic Design Kit:

The mixing box to coil section connection was reinforced using solid 12 gage 1-5/8-inch strut bolted to each section using three 1/4" hex cap bolts per section per length of strut. Two 14-inch lengths of strut were used per top side for a total of four lengths of strut.



Mounting Description:

Unit was ceiling suspended using solid 12 gage 1-5/8-inch strut screwed to the top of the unit with #14 sheet metal screws, spaced approximatley 3-inches on center. 5/8-inch Grade 2 threaded rod was attached through the manufacturer-provided gage steel channel on the bottom of the unit and the solid strut screwed to the top of the unit (see bottom-left photo). The approximate length of the threaded rod between the top of the unit and the DCL steel fixture frame was 10-1/2-inches (nut to nut) as shown in the bottom-right photo). The unit was braced using 45 degree 1/4-inch thick galvanized steel outside angle brackets for strut channel and 3/8-inch diameter general purpose cable (6 x 19 Class IWRC) with 4 saddle clips per cable (2 clips at each connection). Each bracket was attached to the DCL steel fixture frame using a 1/2-inch Grade 5 bolt. The brackets attached to the solid strut at the top of the unit were sandwiched between one 3-inch square 1/4-inch thick plate washer on the bottom and two 4-inch square 1/4-inch thick plate washers on the top as shown in the photo on the bottom-right.

UUT31 Unit Under Test Summary Sheet

DCL Dynamic Certification Laboratories

Manufacturer: Johnson Controls Incorporated

Product Line: Commercial Product Line

Model Number: AHM 08

Options: Coils (2 row heating, 6 row cooling), 9" diameter fan, 208V 3/4HP fan motor, 2" throwaway filter, dampers, 5kW electric heat, switches, transformer and pitot tube

Cabinet Construction Summary

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

Electrical Enclosure: Standard 18 gauge galvanized steel enclosure with hinged door

Dampers : (qty=2) 9"H x 18"W, 14 gauge galvanized steel

Doors: None

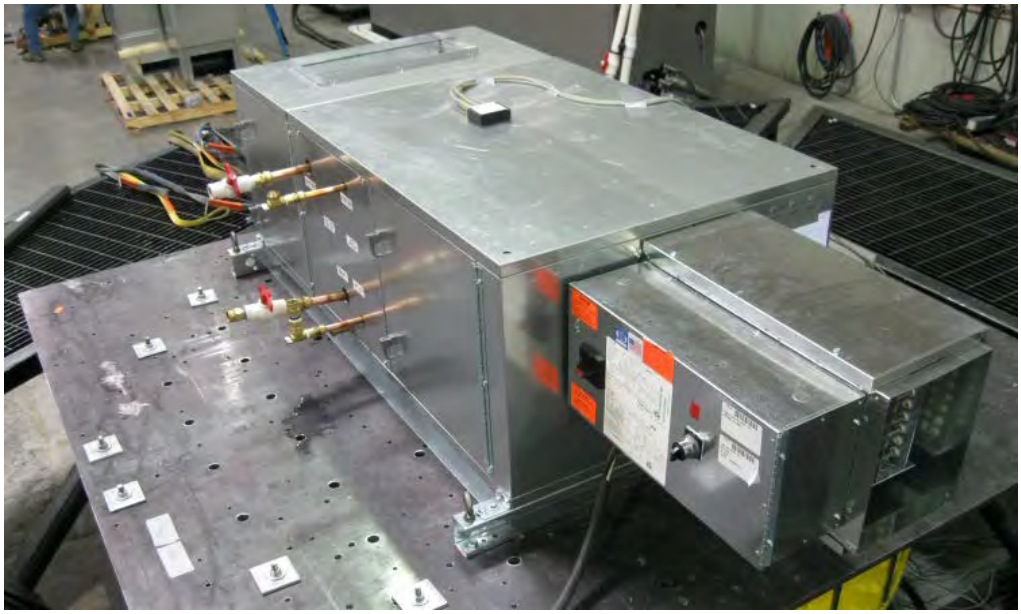
SDS Level Passed: 2.5 g (z/h = 1.0, Ip = 1.5)

	Lowest Natural Frequency			Operating Weight (lbs)
	F-B (Hz)	S-S (Hz)	V (Hz)	
Cabinet	26.3	28.0	27.8	390

Component Summary

Item	Dimensions			
	Length (in)	Width (in)	Height (in)	Weight (lbs)
Main Cabinet	52 1/2	30	21	NA
Electric Heat Module	22	8 7/8	11 7/8	NA
Standard Mixing Box	19	30	22	NA

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.



Unit was rigid base mounted to the shake table interface fixture four 1/2-inch diameter Grade 5 bolts, one on each corner of the unit, using the manufacturer-provided mounting tabs.

UUT32 Unit Under Test Summary Sheet

((●)) DCL Dynamic Certification Laboratories

Manufacturer: Johnson Controls Incorporated

Product Line: Commercial Product Line

Model Number: AHM 40

Options: Coils (2 row heating, 6 row cooling), 13" diameter fan, 460V 5HP fan motor, 2" throwaway filters, dampers, 26kW electric heat, switches, transformer and pitot tube

Cabinet Construction Summary

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

Electrical Enclosure: Standard 18 gauge galvanized steel enclosure with hinged door

Dampers : (qty=2) 15"H x 48"W, 14 gauge galvanized steel

Doors: None

SDS Level Passed: 2.0 g (z/h = 1.0, Ip = 1.5)

	Lowest Natural Frequency			Operating Weight (lbs)
	F-B (Hz)	S-S (Hz)	V (Hz)	
Cabinet	12.3	18.5	15.8	970

Component Summary

Item	Dimensions			
	Length (in)	Width (in)	Height (in)	Weight (lbs)
Main Cabinet	58 1/2	68	30	NA
Electric Heat Module	22	15 5/8	16 5/8	NA
Standard Mixing Box	24	68	31	NA

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.

Unit was rigid base mounted to the shake table interface fixture four 1/2-inch diameter Grade 5 bolts, one on each corner of the unit, using the manufacturer-provided mounting tabs.