APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY	
APPLICATION #:	OSP – 0587

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☒ New ☐ Renewal

Manufacturer Information

Manufacturer: Johnson Controls Inc., York

Manufacturer's Technical Representative: Takao Sei, VRF Product Engineer

Mailing Address: 8304 Esters Blvd., Irving, TX 75063

Telephone: 214-885-1390 Email: takao.sei@jci-hitachi.com

Product Information

Product Name: VRF Gen I and Gen II

Product Type: Heat pump and heat recovery systems

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

General Description: Outdoor air handlers, indoor cassettes and change over boxes. Seismic enhancements made to the test units and modifications required to address the anomalies observed during testing shall be incorporated into the production units.

Mounting Description: See attached

Applicant Information

Applicant Company Name: The VMC Group

Contact Person: John Giuliano

Mailing Address: 113 Main Street, Bloomingdale, NJ 07403

Telephone: (973) 838-1780 Email: john.giuliano@thevmcgroup.com

I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2016.

Signature of Applicant: Joel P. Giuliano Date: 2/4/19

Title: President Company Name: The VMC Group

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

Company Name: The VMC Group

Name: Kenneth Tarlow California License Number: SE-2851

Mailing Address: 113 Main Street, Bloomingdale, NJ 07403

Telephone: (973) 838-1780 Email: ken.tarlow@thevmcgroup.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: Southwest Research Institute

Contact Name: Jenny Ferren, Manager

Mailing Address: 6220 Culebra Road, San Antonio, TX 78238

Telephone: (210) 684-5111 Email: _____

Company Name: DCL Labs

Contact Name: Josh Sailer, Laboratory Manager

Mailing Address: 1315 Greg Street, Suite 109, Sparks, NV 89431

Telephone: (775) 358-5085 Email: josh@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) = 1.50

S_{DS} (Design spectral response acceleration at short period, g) = 2.00

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) = 2.0

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1

Equipment or Component Natural Frequencies (Hz) = See attachment

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

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, 2015: ☐ 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, 2025**

Signature: Date: February 8, 2021

Print Name: Timothy J. Piland Title: SSE

Special Seismic Certification Valid Up to: S_{DS} (g) = 2.00 z/h = 1

Condition of Approval (if applicable):

Table 1: Certified Variable Refrigerant Flow Outdoor Unit Models

Certified level: Sds = 2.00g, z/h=1.0

Model Number	Brand [1]	Heat Recovery vs. Heat Pump	Heating or Cooling Capacity (Tonnage)	Refrigerant	Voltage	Generation	Length (in)	Width (in)	Height (in)	Weight (lb)	Mounting Configuration	Unit
Heat Recovery Units												
(Y,H)VAHR072B32S	York/Hitachi	Heat Recovery	6	R410A	208/230	Gen II	38.4	30.5	66.3	527	Rigid base	Extrapolated
(Y,H)VAHR072B42S	York/Hitachi	Heat Recovery	6	R410A	460	Gen II	38.4	30.5	66.3	534	Rigid base	Extrapolated
(Y,H)VAHR096B32S	York/Hitachi	Heat Recovery	8	R410A	208/230	Gen II	48.6	30.5	66.3	598	Rigid base	Interpolated
(Y,H)VAHR096B42S	York/Hitachi	Heat Recovery	8	R410A	460	Gen II	48.6	30.5	66.3	611	Rigid base	Interpolated
(Y,H)VAHR120B32S	York/Hitachi	Heat Recovery	10	R410A	208/230	Gen II	48.6	30.5	66.3	730	Rigid base	UUT 1
(Y,H)VAHR120B42S	York/Hitachi	Heat Recovery	10	R410A	460	Gen II	48.6	30.5	66.3	734	Rigid base	Interpolated
(Y,H)VAHR144B32S	York/Hitachi	Heat Recovery	12	R410A	208/230	Gen II	48.6	30.5	66.3	732	Rigid base	Interpolated
(Y,H)VAHR144B42S	York/Hitachi	Heat Recovery	12	R410A	460	Gen II	48.6	30.5	66.3	737	Rigid base	Interpolated
(Y,H)VAHR168B32S	York/Hitachi	Heat Recovery	14	R410A	208/230	Gen II	64.0	30.5	66.3	860	Rigid base	Interpolated
(Y,H)VAHR168B42S	York/Hitachi	Heat Recovery	14	R410A	460	Gen II	64.0	30.5	66.3	860	Rigid base	Interpolated
(Y,H)VAHR192B32S	York/Hitachi	Heat Recovery	16	R410A	208/230	Gen II	64.0	30.5	66.3	860	Rigid base	Interpolated
(Y,H)VAHR192B42S	York/Hitachi	Heat Recovery	16	R410A	460	Gen II	64.0	30.5	66.3	880	Rigid base	UUT 2
Heat Pump Units												
(Y,H)VAHP072B32S	York/Hitachi	Heat Pump	6	R410A	208/230	Gen II	38.4	30.5	66.3	516	Rigid base	Extrapolated [2]
(Y,H)VAHP072B42S	York/Hitachi	Heat Pump	6	R410A	460	Gen II	38.4	30.5	66.3	523	Rigid base	Extrapolated [2]
(Y,H)VAHP096B32S	York/Hitachi	Heat Pump	8	R410A	208/230	Gen II	48.6	30.5	66.3	591	Rigid base	Extrapolated [2]
(Y,H)VAHP096B42S	York/Hitachi	Heat Pump	8	R410A	460	Gen II	48.6	30.5	66.3	604	Rigid base	Extrapolated [2]
(Y,H)VAHP120B32S	York/Hitachi	Heat Pump	10	R410A	208/230	Gen II	48.6	30.5	66.3	721	Rigid base	Extrapolated [2]
(Y,H)VAHP120B42S	York/Hitachi	Heat Pump	10	R410A	460	Gen II	48.6	30.5	66.3	725	Rigid base	Extrapolated [2]
(Y,H)VAHP144B32S	York/Hitachi	Heat Pump	12	R410A	208/230	Gen II	48.6	30.5	66.3	723	Rigid base	Extrapolated [2]
(Y,H)VAHP144B42S	York/Hitachi	Heat Pump	12	R410A	460	Gen II	48.6	30.5	66.3	728	Rigid base	Extrapolated [2]
(Y,H)VAHP168B42S	York/Hitachi	Heat Pump	14	R410A	460	Gen II	64.0	30.5	66.3	849	Rigid base	Extrapolated [2]
(Y,H)VAHP168B32S	York/Hitachi	Heat Pump	14	R410A	208/230	Gen II	64.0	30.5	66.3	849	Rigid base	Extrapolated [2]
(Y,H)VAHP192B32S	York/Hitachi	Heat Pump	16	R410A	208/230	Gen II	64.0	30.5	66.3	849	Rigid base	Extrapolated [2]
(Y,H)VAHP192B42S	York/Hitachi	Heat Pump	16	R410A	460	Gen II	64.0	30.5	66.3	849	Rigid base	Extrapolated [2]

NOTES:

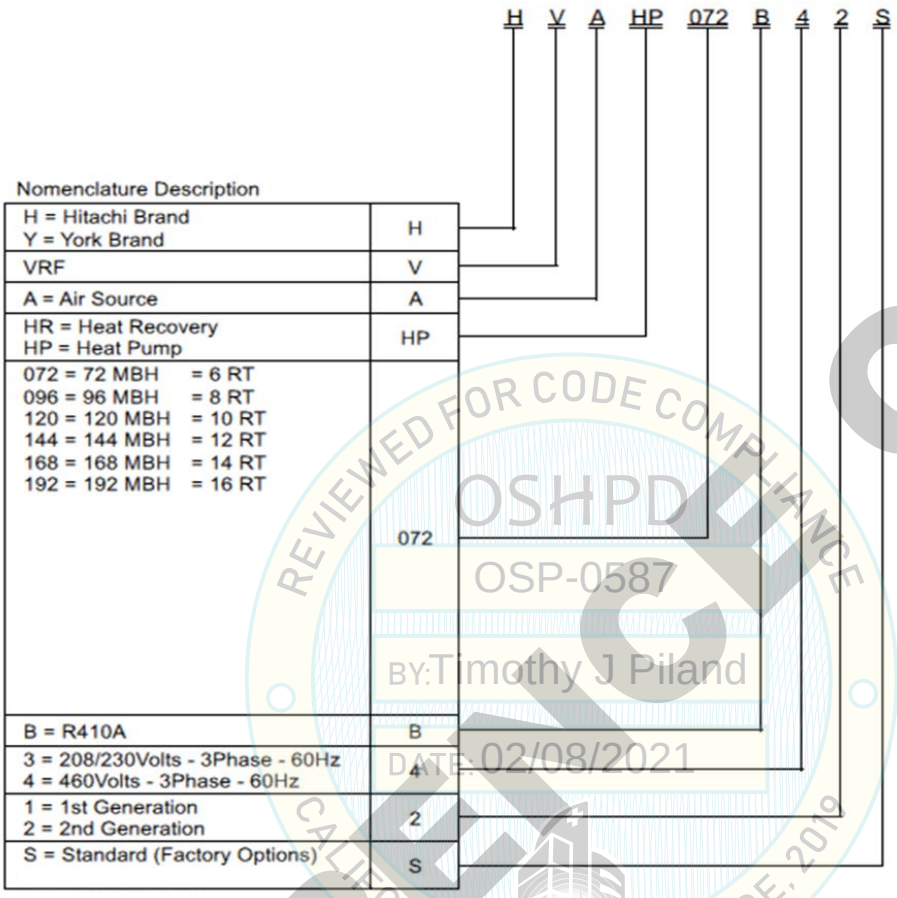
1. JCI controls the design of York and Hitachi brands. Units from both brands are identical.
2. Heat Recovery and Heat Pump units are identical in physical construction and internal subcomponents; only external piping varies. The difference is that a heat recovery system can be connected to three pipes or a change-over box to cool some areas while heating the other. A heat pump can only perform one process at a time (heating or cooling).

Outdoor Units

Unit Nomenclature

- Outdoor Units
  Model Descriptions

Example



Nomenclature Description	
H = Hitachi Brand Y = York Brand	H
VRF	V
A = Air Source	A
HR = Heat Recovery HP = Heat Pump	HP
072 = 72 MBH = 6 RT 096 = 96 MBH = 8 RT 120 = 120 MBH = 10 RT 144 = 144 MBH = 12 RT 168 = 168 MBH = 14 RT 192 = 192 MBH = 16 RT	072
B = R410A	B
3 = 208/230Volts - 3Phase - 60Hz 4 = 460Volts - 3Phase - 60Hz	4
1 = 1st Generation 2 = 2nd Generation	2
S = Standard (Factory Options)	S

Table 2: Certified Variable Refrigerant Flow Indoor Unit Models

Certified level: Sds = 2.00g, z/h=1.0

Model Number	Brand [1]	Heating or Cooling Capacity (Tonnage)	Refrigerant	Voltage	Generation	Length (in)	Width (in)	Height (in)	Weight (lb)	Mounting Configuration	Unit
4-Way Cassette											
(Y,H)ICM008B21S	York/Hitachi	0.70	R410A	208/230	Gen I	22.4	22.4	11.3	35	Ceiling suspended	UUT 5
(Y,H)IC4012B21S	York/Hitachi	1.00	R410A	208/230	Gen I	33.1	33.1	11.3	46	Ceiling suspended	Interpolated
(Y,H)IC4015B21S	York/Hitachi	1.30	R410A	208/230	Gen I	33.1	33.1	11.3	46	Ceiling suspended	Interpolated
(Y,H)IC4018B21S	York/Hitachi	1.50	R410A	208/230	Gen I	33.1	33.1	11.3	48	Ceiling suspended	Interpolated
(Y,H)IC4024B21S	York/Hitachi	2.00	R410A	208/230	Gen I	33.1	33.1	11.7	57	Ceiling suspended	Interpolated
(Y,H)IC4030B21S	York/Hitachi	2.50	R410A	208/230	Gen I	33.1	33.1	11.7	57	Ceiling suspended	Interpolated
(Y,H)IC4036B21S	York/Hitachi	3.00	R410A	208/230	Gen I	33.1	33.1	11.7	57	Ceiling suspended	UUT 6
(Y,H)IC4048B21S	York/Hitachi	4.00	R410A	208/230	Gen I	33.1	33.1	11.7	57	Ceiling suspended	Extrapolated
Ducted Medium Static											
(Y,H)IDM006B22S	York/Hitachi	0.50	R410A	208/230	Gen II	31.5	27.6	9.8	57	Ceiling suspended	Extrapolated
(Y,H)IDM008B22S	York/Hitachi	0.70	R410A	208/230	Gen II	31.5	27.6	9.8	57	Ceiling suspended	Extrapolated
(Y,H)IDM012B22S	York/Hitachi	1.00	R410A	208/230	Gen II	31.5	27.6	9.8	60	Ceiling suspended	Extrapolated
(Y,H)IDM015B22S	York/Hitachi	1.30	R410A	208/230	Gen II	31.5	27.6	9.8	63	Ceiling suspended	UUT 7
(Y,H)IDM018B22S	York/Hitachi	1.50	R410A	208/230	Gen II	31.5	41.3	9.8	79	Ceiling suspended	Interpolated
(Y,H)IDM024B22S	York/Hitachi	2.00	R410A	208/230	Gen II	31.5	41.3	9.8	79	Ceiling suspended	Interpolated
(Y,H)IDM027B22S	York/Hitachi	2.30	R410A	208/230	Gen II	31.5	41.3	9.8	79	Ceiling suspended	Interpolated
(Y,H)IDM030B22S	York/Hitachi	2.50	R410A	208/230	Gen II	31.5	55.1	9.8	97	Ceiling suspended	Interpolated
(Y,H)IDM036B22S	York/Hitachi	3.00	R410A	208/230	Gen II	31.5	55.1	9.8	97	Ceiling suspended	Interpolated
(Y,H)IDM048B22S	York/Hitachi	4.00	R410A	208/230	Gen II	31.5	55.1	9.8	97	Ceiling suspended	Interpolated
(Y,H)IDM054B22S	York/Hitachi	4.50	R410A	208/230	Gen II	31.5	55.1	9.8	97	Ceiling suspended	Interpolated
Ducted High Static [2]											
(Y,H)IDH015B22S	York/Hitachi	1.30	R410A	208/230	Gen II	31.5	27.6	11.8	64	Ceiling suspended	Interpolated
(Y,H)IDH018B22S	York/Hitachi	1.50	R410A	208/230	Gen II	31.5	41.3	11.8	84	Ceiling suspended	Interpolated
(Y,H)IDH024B22S	York/Hitachi	2.00	R410A	208/230	Gen II	31.5	41.3	11.8	84	Ceiling suspended	Interpolated
(Y,H)IDH027B22S	York/Hitachi	2.30	R410A	208/230	Gen II	31.5	41.3	11.8	84	Ceiling suspended	Interpolated
(Y,H)IDH030B22S	York/Hitachi	2.50	R410A	208/230	Gen II	31.5	55.1	11.8	106	Ceiling suspended	Interpolated
(Y,H)IDH036B22S	York/Hitachi	3.00	R410A	208/230	Gen II	31.5	55.1	11.8	106	Ceiling suspended	Interpolated
(Y,H)IDH048B22S	York/Hitachi	4.00	R410A	208/230	Gen II	31.5	55.1	11.8	106	Ceiling suspended	Interpolated
(Y,H)IDH054B22S	York/Hitachi	4.50	R410A	208/230	Gen II	32.0	58.0	11.8	110	Ceiling suspended	UUT 8

NOTES:

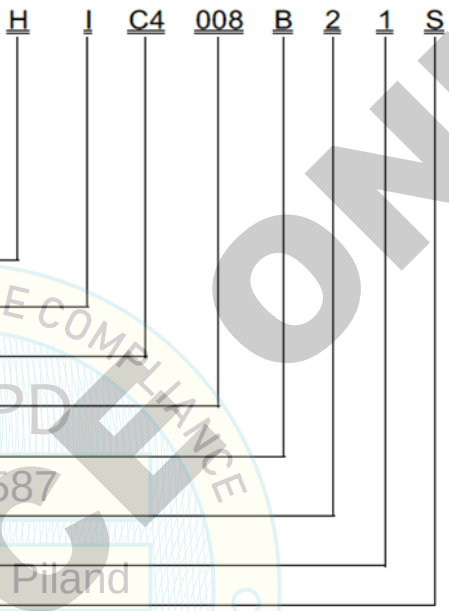
1. JCI controls the design of York and Hitachi brands. Units from both brands are identical.
2. Ducted Medium Static and Ducted High Static are similar in design. Ducted high static units are designed to provide higher static pressures and more air flow.

4-Way Cassette

Unit Nomenclature

Model Descriptions

Example



Nomenclature Description

H = Hitachi Brand Y = York Brand	H
Indoor Unit	I
Indoor Unit Type C4 = 4-Way Cassette	C4
Capacity (MBH)	008
Refrigerant Type B = R410A	B
Power Supply 2 = 208/230Volts - 1Phase - 60Hz	2
1 = 1st Generation	1
S = Standard Type	S

Ducted (High and Medium Static) Type

Unit Nomenclature

Model Descriptions

Example

H I DH 015 B 2 2 S

Nomenclature Description	
H = Hitachi Brand Y = York Brand	H
Indoor Unit	I
Indoor Unit Type DH = High Static DM = Medium Static	DH
Capacity (MBH)	015
Refrigerant Type B = R410A	B
Voltage 2 = 208/230Volts - 1Phase - 60Hz	2
2 = 2nd Generation	2
S = Standard Type	S

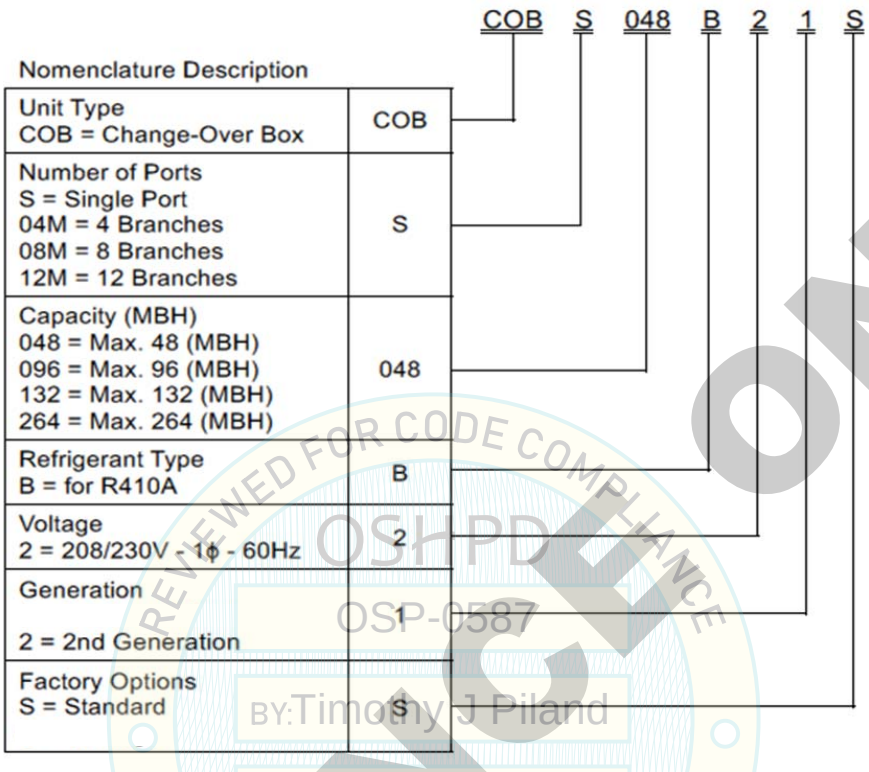
Table 3: Certified Change-Over Boxes

Certified level: Sds = 2.00g, z/h=1.0

Model Number	Product Description	Heating or Cooling Capacity (Tonnage)	Refrigerant	Generation	Length (in)	Width (in)	Height (in)	Weight (lb)	Mounting Configuration	UUT
COBS048B22S	Single Branch Change-Over Box	4	R410A	Gen II	8.4	11.9	7.5	13	Ceiling Suspended	Extrapolated
COBS096B22S	Single Branch Change-Over Box	8	R410A	Gen II	8.4	11.9	7.5	13	Ceiling Suspended	Extrapolated
COB04M132B22S	Multiple Branch Change-Over Box	11	R410A	Gen II	13.9	11.9	10.3	31	Ceiling Suspended	UUT 11
COB08M264B22S	Multiple Branch Change-Over Box	22	R410A	Gen II	13.9	21.4	10.3	56	Ceiling Suspended	Interpolated
COB12M264B22S	Multiple Branch Change-Over Box	22	R410A	Gen II	13.9	30.8	10.3	80	Ceiling Suspended	UUT 12

Change-Over Box

Unit Nomenclature



Nomenclature Description	
Unit Type COB = Change-Over Box	COB
Number of Ports S = Single Port 04M = 4 Branches 08M = 8 Branches 12M = 12 Branches	S
Capacity (MBH) 048 = Max. 48 (MBH) 096 = Max. 96 (MBH) 132 = Max. 132 (MBH) 264 = Max. 264 (MBH)	048
Refrigerant Type B = for R410A	B
Voltage 2 = 208/230V - 1ϕ - 60Hz	2
Generation 2 = 2nd Generation	1
Factory Options S = Standard	S

Table 4: Tested Units

Certified level: Sds = 2.00g, z/h=1.0

Model Number	Product Type	Generation	Length (in)	Width (in)	Height (in)	Weight (lb)	Mounting Configuration	Report UUT ID (Document Number)	UUT
(Y,H)VAHR120B32S	ODU	Gen II	48.6	30.5	66.3	730	Rigid base	UUT 1 (4)	UUT 1
(Y,H)VAHR192B42S	ODU	Gen II	64.0	30.5	66.3	880	Rigid base	UUT 2 (4)	UUT 2
(Y,H)ICM008B21S	IDU	Gen I	22.4	22.4	11.3	35	Ceiling suspended	EUT 19 (5)	UUT 5
(Y,H)IC4036B21S	IDU	Gen I	33.1	33.1	11.7	57	Ceiling suspended	EUT 20 (5)	UUT 6
(Y,H)IDM015B22S	IDU	Gen II	31.5	27.6	9.8	63	Ceiling suspended	UUT 7 (6)	UUT 7
(Y,H)IDH054B22S	IDU	Gen II	32.0	58.0	11.8	110	Ceiling suspended	UUT 8 (6)	UUT 8
COB04M132B22S	COB	Gen II	13.9	11.9	10.3	31	Ceiling Suspended	UUT 11 (6)	UUT 11
COB12M264B22S	COB	Gen II	13.9	30.8	10.3	80	Ceiling Suspended	UUT 12 (6)	UUT 12

UUT1

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: John Controls Inc., York, Hitachi

Product Line: JCI Gen I,II Air Systems

Model Number: (Y,H)VAHR120B32S

Product Construction Summary: Painted-coated carbon steel frame

Options / Component Summary: Compressors, fans, heat exchangers

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.

UUT Properties

Operating Weight (lb)	Dimensions (in)				Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
730	UUT1	48.6	30.5	66.3	8.0	6.5	25.0

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 2019	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53

Unit Mounting Description:

UUT 1 was rigid base mounted to the DCL interface fixture with (4) 1/2'' diameter, Grade 5, bolts spaced approximately 38'' lengthwise and 29'' widthwise on center.

UUT2

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: John Controls Inc., York, Hitachi

Product Line: JCI Gen I,II Air Systems

Model Number: (Y,H)VAHR192B42S

Product Construction Summary: Painted-coated carbon steel frame

Options / Component Summary: Compressors, fans, heat exchangers

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.

UUT Properties

Operating Weight (lb)	Dimensions (in)				Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
880	UUT 2	64.0	30.5	66.3	6.5	8.5	19.5

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 2019	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53

Unit Mounting Description:

UUT 2 was rigid base mounted to the DCL interface fixture with (6) 1/2'' diameter, Grade 5, bolts spaced approximately 26'' lengthwise and 29'' widthwise on center.

UUT5 (EUT19)

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: John Controls Inc., York, Hitachi

Product Line: JCI Gen I,II Air Systems

Model Number: (Y,H)ICM008B21S

Product Construction Summary: Painted-coated carbon steel frame, plastic

Options / Component Summary: Fans, heat exchangers

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.

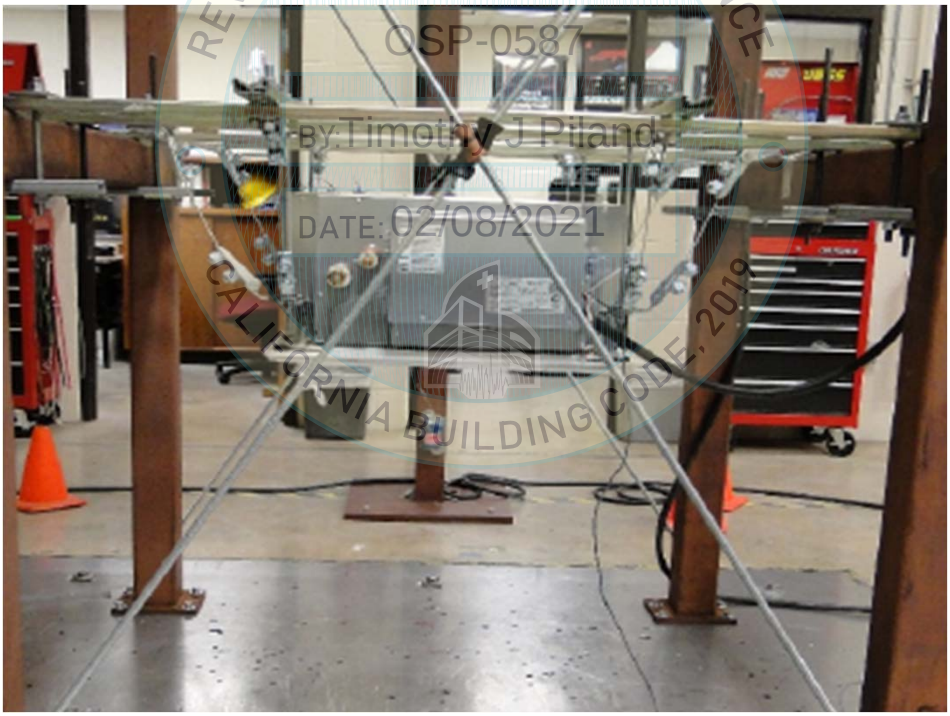
UUT Properties

Operating Weight (lb)	Dimensions (in)				Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
35	UUT 5 (EUT19)	22.4	22.4	11.3	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 2019	ICC-ES AC156	2.50	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:



UUT 5 was ceiling suspended with 3/8'' ASTM A307 Grade B threaded rod spaced approximately 23'' in both length and width directions. Each threaded rod was braced in the lateral direction with (2) Mason SCB-1 cable kits with 1/8'' diameter steel cable attached at 90 degrees of each other in the horizontal direction and 45 digress in the vertical direction. A single 3/8'' nut and washer on either side attached the drop rod and cable bracing to the UUT. The unit was hung approximately 12'' from the bottom of the ceiling fixture.

UUT6 (EUT 20)

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: John Controls Inc., York, Hitachi

Product Line: JCI Gen I,II Air Systems

Model Number: (H,Y)IC4036B21S

Product Construction Summary: Painted-coated carbon steel frame, plastic

Options / Component Summary: Fans, heat exchangers

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.

UUT Properties

Operating Weight (lb)	Dimensions (in)				Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
57	UUT 6 (EUT20)	33.1	33.1	11.7	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 2019	ICC-ES AC156	2.50	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

UUT 6 was ceiling suspended with 3/8'' ASTM A307 Grade B threaded rod spaced approximately 34'' in both length and width directions. Each threaded rod was braced in the lateral direction with (2) Mason SCB-1 cable kits with 1/8'' diameter steel cable attached at 90 degrees of each other in the horizontal direction and 45 digress in the vertical direction. A single 3/8'' nut and washer on either side attached the drop rod and cable bracing to the UUT. The unit was hung approximately 10'' from the bottom of the ceiling fixture.

UUT 7

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: John Controls Inc., York, Hitachi

Product Line: JCI Gen I,II Air Systems

Model Number: (Y,H)IDM015B22S

Product Construction Summary: Painted-coated carbon steel frame, plastic

Options / Component Summary: Fans, heat exchangers

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.

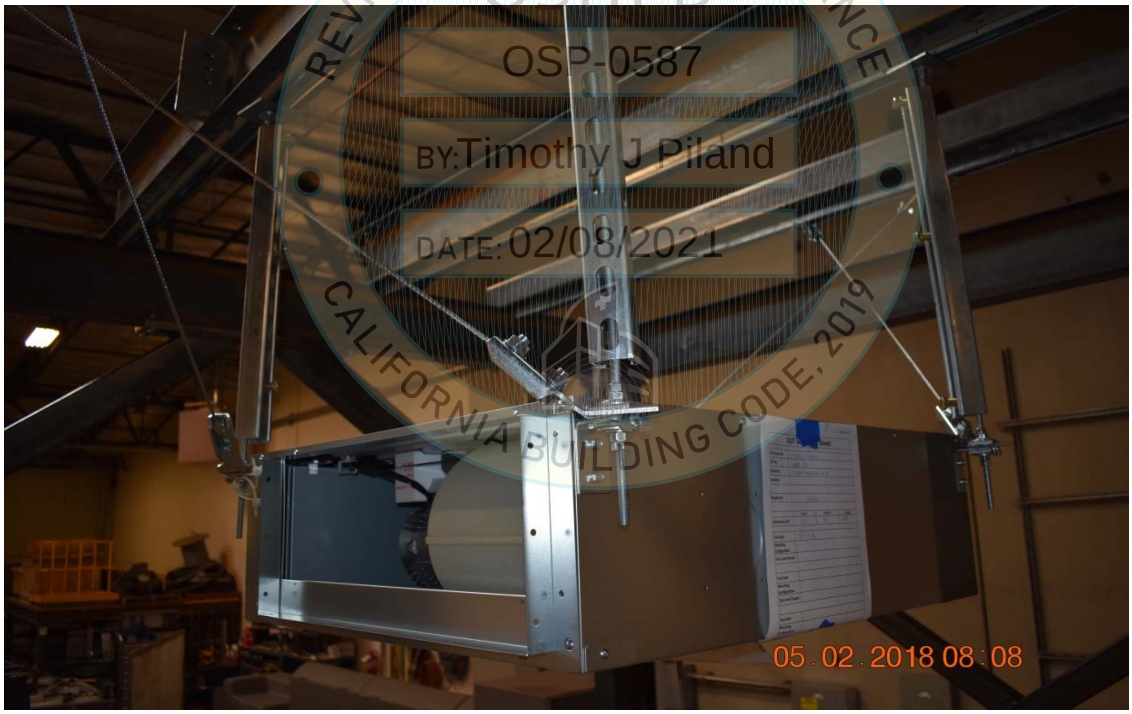
UUT Properties

Operating Weight (lb)	Dimensions (in)				Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
63	UUT 7	31.5	27.6	9.8	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 2019	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53

Unit Mounting Description:



UUT 7 was ceiling suspended with a 3/8'' diameter ASTM A307 Grade B threaded rod spaced approximately 32'' in lengthwise and 26'' widthwise on center. The threaded rod was stiffened with a single 1 5/8'' piece of strut 22'' in length and fastened with (3) Cooper industries SC228 1/2'' rod stiffener clips. Each threaded rod was braced in the lateral direction with a single 3/16'' diameter steel cable through VMC SCB1 brackets attached at 45 degrees in both the horizontal and vertical direction. The threaded rod attached to the unit with a double 3/8'' diameter nuts and washers with a 1.5'' x 1.5'' x 3/16'' low carbon steel plate washer on either side. The unit was hung approximately 24'' from the bottom of the fixture.

UUT 8

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: John Controls Inc., York, Hitachi

Product Line: JCI Gen I,II Air Systems

Model Number: (Y,H)IDH054B22S

Product Construction Summary: Painted-coated carbon steel frame, plastic

Options / Component Summary: Fans, heat exchangers

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.

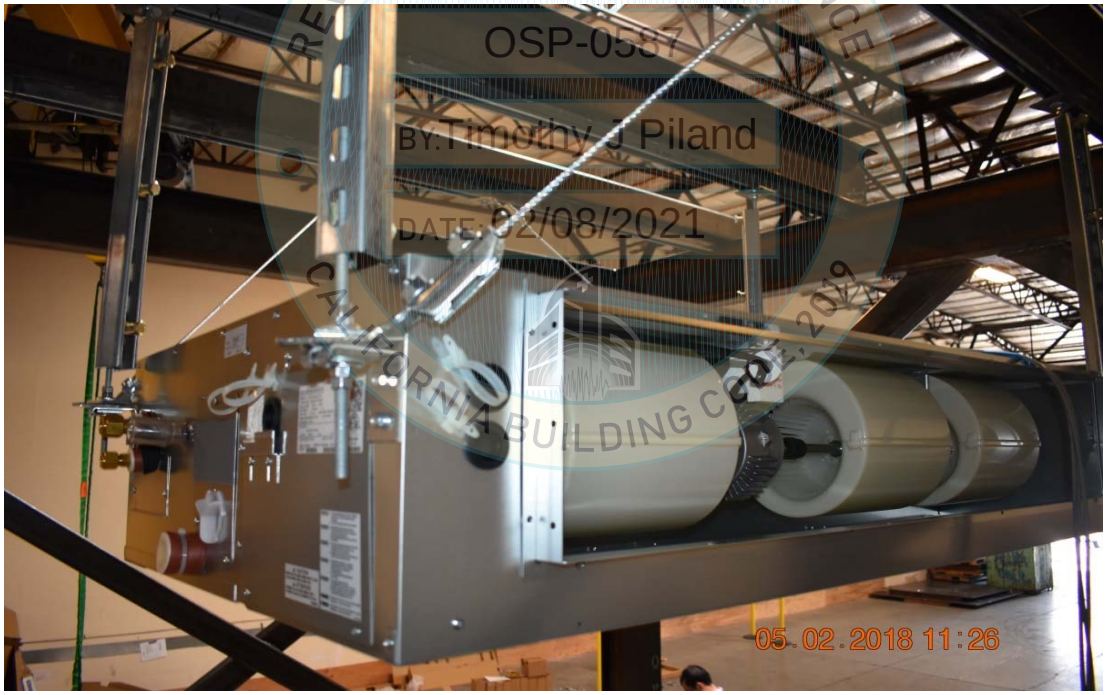
UUT Properties

Operating Weight (lb)	Dimensions (in)				Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
110	UUT 8	32.0	58.0	11.8	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 2019	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53

Unit Mounting Description:



UUT 8 was ceiling suspended with a 3/8'' diameter ASTM A307 Grade B threaded rod spaced approximately 31'' in lengthwise and 58'' widthwise on center. The threaded rod was stiffened with a single 1 5/8'' piece of strut 22'' in length and fastened with (3) Cooper industries SC228 1/2'' rod stiffener clips. Each threaded rod was braced in the lateral direction with a single 3/16'' diameter steel cable through VMC SCB1 brackets attached at 45 degrees in both the horizontal and vertical direction. The threaded rod attached to the unit with a double 3/8'' diameter nuts and washers with a 1.5'' x 1.5'' x 3/16'' low carbon steel plate washer on either side. The unit was hung approximately 24'' from the bottom of the fixture.

UUT 11

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: John Controls Inc., York, Hitachi

Product Line: JCI Gen I,II Air Systems

Model Number: COB04M132B22S

Product Construction Summary: Carbon steel box, copper piping

Options / Component Summary: Copper piping, solenoid valves

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.

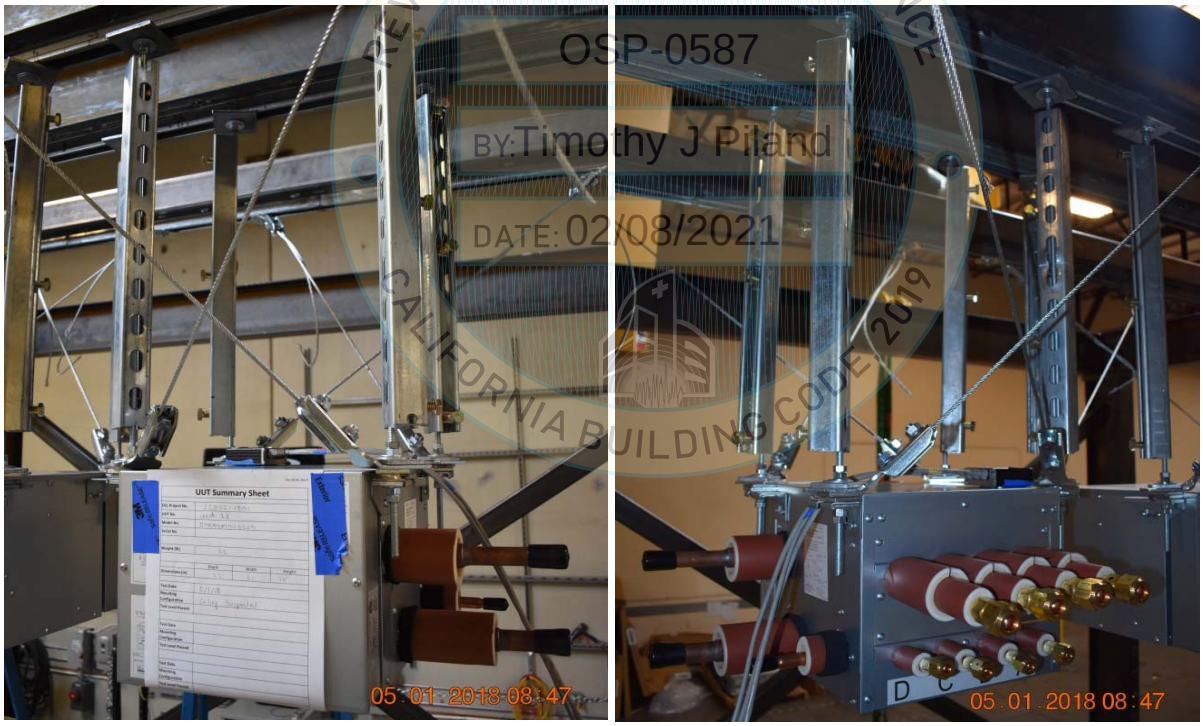
UUT Properties

Operating Weight (lb)	Dimensions (in)				Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
31	UUT 11	13.9	11.9	10.3	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 2019	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53

Unit Mounting Description:



UUT 11 was ceiling suspended with (4) 3/8'' diameter ASTM A307 Grade B threaded rod spaced approximately 11'' widthwise and 14'' lengthwise on center. Each threaded rod was braced in the lateral direction with a VMC Group SCB1 cable sway kit at 45 degrees in the vertical and horizontal direction using 3/16'' diameter steel cable. The rod was stiffened with 22'' sections of 12 ga strut fastened with(3) Cooper industries SC228 1/2'' rod stiffener clips. Three 1.5'' x 1.5'' x 3/16'' low carbon steel plate washers (two on top, one on bottom) were used between double nuts and washers to fasten the threaded rod to the UUT. The unit was hung approximately 24'' from the bottom of the fixture.

UUT 12

UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: John Controls Inc., York, Hitachi

Product Line: JCI Gen I,II Air Systems

Model Number: COB12M264B22S

Product Construction Summary: Carbon steel box, copper piping

Options / Component Summary: Copper piping, solenoid valves

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.

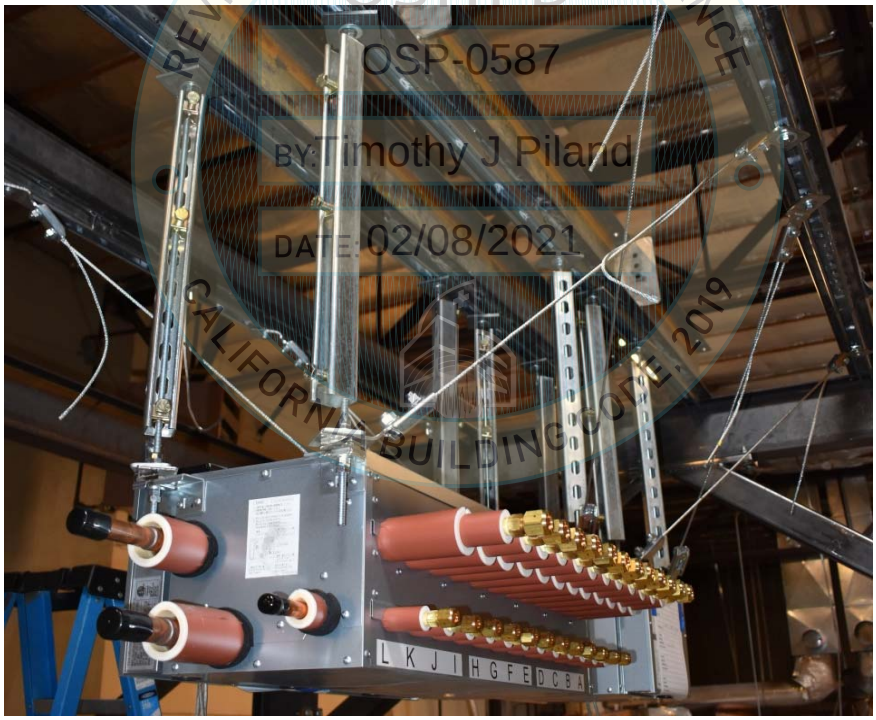
UUT Properties

Operating Weight (lb)	Dimensions (in)				Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
80	UUT 12	13.9	30.8	10.3	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 2019	ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53

Unit Mounting Description:



UUT 12 was ceiling suspended with (4) 3/8'' diameter ASTM A307 Grade B threaded rod spaced approximately 13'' widthwise and 31'' lengthwise on center. Each threaded rod was braced in the lateral direction with a VMC Group SCB1 cable sway kit at 45 degrees in the vertical and horizontal direction using 3/16'' diameter steel cable. The rod was stiffened with 22'' sections of 12 ga strut fastened with (3) Cooper industries SC228 1/2'' rod stiffener clips. Three 1.5'' x 1.5'' x 3/16'' low carbon steel plate washers (two on top, one on bottom) were used between double nuts and washers to fasten the threaded rod to the UUT. The unit was hung approximately 24'' from the bottom of the fixture.