



APPLICATION FOR PREAPPROVAL

SPECIAL SEISMIC CERTIFICATION OF EQUIPMENT AND COMPONENTS

For Office Use Only

APPLICATION NO.
OSP-0255-10

Check whether application is: NEW RENEWAL

1.0	YORK Unitary Engineering /Johnson Controls Incorporated <i>Manufacturer</i>	Randy Forristall <i>Manufacturer's Technical Representative</i>
	5757 N. Green Bay Ave.	Milwaukee, WI 53201
	<i>Mailing Address</i>	
	(405) 419-6453 <i>Telephone</i>	Randall.C.Forristall@jci.com <i>E-mail Address</i>

2.0	UPG Packaged Rooftop Units <i>Product Name</i>	Air Handling Equipment <i>Product Type</i>
	<i>ZF/ZSIJ**ZF/IT*, XP/IXAJ**XP/IT*, ZJ/ZWIJ**ZJIT* and ZR/ZKIJ**ZRIT* UPG Packaged Rooftop Units, 15-25 Ton</i> <i>Product model No (List all unique product identification numbers and/or serial numbers)</i>	

General Description:

The York large Sunline/JCI series 20 family consists of air cooled, outdoor mounted packaged cooling only, MagnaDRY reheat, and heat pump units, ranging from 15 to 25 tons of cooling capacity. The units are factory-available as reheat or cooling only (CO), CO with electric heat, CO with gas heat, and heat pump models with or without electric heat. Seismic enhancement made to the test units and modifications required to address the anomalies observed during the tests shall be incorporated into the production units.

3.0	DYNAMIC CERTIFICATION LABORATORIES, LLC <i>Applicant Company Name</i>	JOSEPH LA BRIE, S.E. <i>Contact Person</i>
	1315 GREG STREET, SUITE 109	SPARKS, NV 89431
	<i>Mailing Address</i>	
	(775) 358-5085 <i>Telephone</i>	LaBrie@makeitright.net <i>E-mail Address</i>

I hereby agree to reimburse the Office of Statewide Health Planning and Development for the actual costs incurred by the department for review.

	02/07/2012
<i>Signature of Applicant</i>	<i>Date</i>
Managing Partner	Dynamic Certification Laboratories, LLC
<i>Title</i>	<i>Company Name</i>



Registered Design Professional Preparing the Report

4.0 DYNAMIC CERTIFICATION LABORATORIES, LLC
Company Name

JOSEPH LA BRIE, S.E. SE-3566
Contact Name California License Number

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

(626) 445-0366 LaBrie@MakeltRight.net
Telephone E-mail Address

California Licensed Structural Engineer Review and Acceptance of the Report

5.0 DYNAMIC CERTIFICATION LABORATORIES, LLC
Company Name

DR. AHMAD ITANI, SE SE-5220
Contact Name California License Number

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

(775) 358-5085 Itani@shaketest.com
Telephone E-mail Address

Anchorage Pre-Approval

6.0 Anchorage is pre-approved under OPA-
 (Separate application for anchorage pre-approval is required)

Anchorage is not Pre-approved

Certification Method

70. Testing in accordance with: ICC-ES AC-156 Other (Please Specify):

Analysis

Experience data

Combination of Testing, Analysis, and/or Experience Data (Please Specify): Testing

Testing Laboratory (if applicable)

8.0 DYNAMIC CERTIFICATION LABORATORIES, LLC KELLY LAPLACE, PROJECT ENGINEER
Company Name Contact Name

1315 GREG STREET, STE 109, SPARKS, NV 89431
Mailing Address

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



Approval Parameters

9.0

Design in accordance with ASCE 7-05 Chapter 13: Yes No

Design Basis of Equipment or Components (F_p/W_p) = 1.5 (on rigid curbs); 4.5 (on spring isolated curbs)

S_{DS} (Spectral response acceleration at short period) = 2.0 g

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

R_p (Equipment or component response modification factor) = 6.0 (on rigid curbs); 2.0 (on spring isolated curbs)

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1.0

Equipment or Component fundamental period(s) = SEE ATTACHMENT

Building period limits (if any) = NONE

Overall dimensions and weight (or range thereof) = SEE ATTACHMENT

Equipment or Components @ grade designed in accordance with ASCE 7-05 Chapter 15: Yes No

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

S_{DS} (Spectral response acceleration at short period) =

S_1 (Spectral response acceleration at 1 second period) =

R (Response modification coefficient) = 1.0

Ω_0 (System overstrength factor) = 1.0

C_d (Deflection amplification factor) = 1.0

I_p (Importance factor) = 1.5

Height to Center of Gravity above base =

Equipment or Component fundamental period(s) = Sec

Overall dimensions and weight (or range thereof) =

Tank(s) designed in accordance with ASME BPVC, 2007: Yes No

List of attachments supporting the special seismic certification of equipment or components:

- Test Report
- Drawings
- Manufacturer's Catalog
- Calculations
- Others (Please Specify):

11.0 OSHPD Approval (For Office Use Only)

2/28/2012

December 31, 2016

Signature & Date

M. R. Karim, SHFR

Approval Expiration Date

S_{DS} (g) = **2.0** z/h = **1.0**

Name & Title

Special Seismic Certification Valid Up to

Condition of Approval (if any):

Special Seismic Certification Tested Units



Manufacturer: Unitary Product Group (York, Johnson Controls, Coleman, Luxaire, Evcon and Fraser-Johnston)

Product Line: York Large Sunline/JCI Series 20 Family

Tested Product Construction:

Cabinet is constructed of G90 galvanized 1,000 hour salt spray (per ASTM-B117) rated powder-coated 20 gage carbon steel wrapper and duct panel with integral corner posts, all attached at the base to four (4) full perimeter 14 gage base rails with #10 sheet metal screws.

Tested Options:

230-575 V, motor, coils, fans, compressors, refrigeration units

Tested Mounting Description:

Equipment was tested with both rigid and flexible (spring isolated) roof curb mounting

Product Line	Model Number	Dimensions (inches)				Operating Weight (lb)	Nominal Cooling Capacity (Tons)	Mount	Sds level Approved	Unit		
		Top Length	Base Length	Width	Height							
York Large Sunline/JCI Series 20 Family	ZR180N24C2DZZ1	181	136	92	53	2,850	15	Rigid Roof Curb	2.0	1a		
								Isolated Roof Curb		1b		
	ZR300N32N5GZZ1	181	136	92	53	3,340	25	Rigid Roof Curb		2a		
								Isolated Roof Curb		2b		
	XP180E18A2BAC1	136	136	92	53	2,190	15	Rigid Roof Curb		3a		
								Isolated Roof Curb		3b		
	XP240E72N5HZZ1	181	136	92	53	2,690	20	Rigid Roof Curb		4a		
								Isolated Roof Curb		4b		
	ZJ300S32R5BAC1	181	136	92	53	3,320	25	Rigid Roof Curb		5a		
								Isolated Roof Curb		5b		
	ZF180S24A2BZZ1	125	125	92	48	2,100	15	Rigid Roof Curb		6a		
								Isolated Roof Curb		6b		
	Predator Air Handling Unit (Standard)*	XP078E09A2BAC5	89	n/a	59	42	970	6.5		Rigid Roof Curb	2.5	7a
										Isolated Roof Curb		7b

*Predator unit listed here for inclusion of Bristol Compressors.

Special Seismic Certification Approved Units



Manufacturer: Unitary Product Group (York, Johnson Controls, Coleman, Luxaire, Evcon, Fraser-Johnston and Ready Ship)

Product Line: York Large Sunline/JCI Series 20 Family

Certified Product Construction:

Cabinet is constructed of G90 galvanized 1,000 hour salt spray (per ASTM-B117) rated powder-coated 20 gage carbon steel wrapper and duct panel with integral corner posts, all attached at the base to four (4) full perimeter 14 gage base rails with #10 sheet metal screws.

Certified Options:

230-575 V, economizer, power exhaust, electric or gas heater, variable frequency drive

Certified Mounting Description:

Equipment is certified for rigid or flexible (spring isolated) roof curb mounting

Product Line	Model Number	Size	Dimensions (inches)				Operating Weight (lb)	Nominal Cooling Capacity (Tons)	Sds level Approved	Unit
			Top Length	Base Length	Width	Height				
York Small Sunline/JCI Series 20 Family	ZF/ZS/J**ZF/T*	180	125	125	92	48	2,100	15	2.0	UUT6a, b
	XP/XA/J**XP/T*	180	136	136	92	53	2,190			UUT3a, b
	ZJ/ZW/J**ZJ/T*	180	181	136	92	53	2,609-3,340			Interpolated
	ZR/ZK/J**ZR/T*	180	181	136	92	53	2,850	17.5		UUT1a, b
	ZF/ZS/J**ZF/T*	210	136	136	92	53	2,006-2,751			Interpolated
	ZJ/ZW/J**ZJ/T*	210	181	136	92	53	2,665-3,410	Interpolated		
	ZF/ZS/J**ZF/T*	240	136	136	92	53	2,533-3,278	20		Interpolated
	XP/XA/J**XP/T*	240	181	136	92	53	2,690			UUT4a, b
	ZJ/ZW/J**ZJ/T*	240	181	136	92	53	2,697-3,442			Interpolated
	ZR/ZK/J**ZR/T*	240	181	136	92	53	2,660-3,405	25		Interpolated
	ZF/ZS/J**ZF/T*	300	136	136	92	53	2,597-3,342			Interpolated
	ZJ/ZW/J**ZJ/T*	300	181	136	92	53	3,320			UUT5a, b
	ZR/ZK/J**ZR/T*	300	181	136	92	53	3,340			UUT2a, b
Predator Air Handling Unit (Standard)*	XP078E09A2BAC5	78	89	n/a	59	42	970	6.5	2.5	UUT7a, b

*Predator unit listed here for inclusion of Bristol Compressors.

UUT1a Unit Under Test Summary Sheet



Manufacturer: Unitary Product Group

Product Line: York Large Sunline/JCI Series 20

Model Number: ZR180N24C2DZZ1

Product Construction Summary:

Cabinet is constructed of G90 galvanized steel, with powder-coated finish, certified at 1,000 hours salt spray test per ASTM B 117.

Options / Component Summary:

Reheat MagnaDRY, 230V, 15-ton, W-shaped outdoor coil, four OD fans, two scroll compressors, two refrigeration circuits, 5HP IDB motor, VFD with hot gas bypass, 15"x15" blower wheel, six-tube aluminized gas fired heat exchanger (300MBH, two-stage).

UUT Properties

Operating Weight (lb)	Dimensions (inches)				Lowest Natural Frequency (Hz)		
	Top Length	Base Length	Width	Height	Front-Back	Side-Side	Vertical
2,850	181	136	92	53	6.0	7.5	10.0

Seismic Test Parameters								
Building Code	Test Criteria	Sds	z/h	Ip	Aflx-H	Arig-H	Aflx-V	Arig-V
CBC 2010	2010 ICC-ES AC156	2.00	1.0	1.5	3.2	2.4	1.33	0.53

Note: The UUT was filled with operating fluid for the seismic simulation test and was operational before and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

Unit Mounting Description: Rigid roof curb mount



UUT1a mounted to shake table and ready for test.

UUT1a was tested on a rigid roof curb by Ruskin. The curb had twelve 1/8-inch thick anchoring pockets, four on each side of the long direction of the curb and two on each short side. The unit was attached to each of the pockets using two 1/4-20 x 5-inch self-drilling screws. The curb was attached to the 3/4-inch thick steel shake table interface plate with ten 1/2-inch diameter Grade 5 bolts, one-foot in from each corner and one centered on each of the long sides. The shake table interface plate was attached to the shake table platen using M12 threaded rod, spaced approximately 8-inches on-center.

UUT1b Unit Under Test Summary Sheet



Manufacturer: Unitary Product Group

Product Line: York Large Sunline/JCI Series 20

Model Number: ZR180N24C2DZZ1

Product Construction Summary:

Cabinet is constructed of G90 galvanized steel, with powder-coated finish, certified at 1,000 hours salt spray test per ASTM B 117.

Options / Component Summary:

Reheat MagnaDRY, 230V, 15-ton, W-shaped outdoor coil, four OD fans, two scroll compressors, two refrigeration circuits, 5HP IDB motor, VFD with hot gas bypass, 15"x15" blower wheel, six-tube aluminized gas fired heat exchanger (300MBH, two-stage).

UUT Properties

Operating Weight (lb)	Dimensions (inches)				Lowest Natural Frequency (Hz)		
	Top Length	Base Length	Width	Height	Front-Back	Side-Side	Vertical
2,850	181	136	92	53	4.8	4.5	8.3

Seismic Test Parameters

Building Code	Test Criteria	Sds	z/h	Ip	Aflx-H	Arig-H	Aflx-V	Arig-V
CBC 2010	2010 ICC-ES AC156	2.00	1.0	1.5	3.2	2.4	1.33	0.53

Note: The UUT was filled with operating fluid for the seismic simulation test and was operational before and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

Unit Mounting Description: Isolated roof curb mount



UUT1b mounted to shake table and ready for test.

UUT1b was tested on a spring-isolated roof curb by MicroMetl. The curb had eight 10-gage anchoring pockets, four on each long side of the curb. The unit was attached to each of the pockets using seven #12x1/2-inch TEK screws. The curb was attached to the 3/4-inch thick steel shake table interface plate with twelve 1/2-inch diameter Grade 5 bolts, four on each long side of the curb and two on each short side. The shake table interface plate was attached to the shake table platen using M12 threaded rod, spaced approximately 8-inches on-center.

UUT2a Unit Under Test Summary Sheet



Manufacturer: Unitary Product Group

Product Line: York Large Sunline/JCI Series 20

Model Number: ZR300N32N5GZZ1

Product Construction Summary:

Cabinet is constructed of G90 galvanized steel, with powder-coated finish, certified at 1,000 hours salt spray test per ASTM B 117.

Options / Component Summary:

Reheat MagnaDRY, 575V, 25-ton, W-shaped outdoor coil, four OD fans, two scroll compressors, two refrigeration circuits, 15HP IDB motor, VFD with hot gas bypass, VFD manual bypass switch, stainless steel drain pan, 18"x15" blower wheel, eight-tube aluminized gas fired heat exchanger (400MBH).

UUT Properties

Operating Weight (lb)	Dimensions (inches)				Lowest Natural Frequency (Hz)		
	Top Length	Base Length	Width	Height	Front-Back	Side-Side	Vertical
3,340	181	136	92	53	5.5	6.5	9.0

Seismic Test Parameters

Building Code	Test Criteria	Sds	z/h	Ip	Aflx-H	Arig-H	Aflx-V	Arig-V
CBC 2010	2010 ICC-ES AC156	2.00	1.0	1.5	3.2	2.4	1.33	0.53

Note: The UUT was filled with operating fluid for the seismic simulation test and was operational before and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

Unit Mounting Description: Rigid roof curb mount



UUT2a mounted to shake table and ready for test.

UUT2a was tested on a rigid roof curb by MicroMetl. The curb had eight 10-gage anchoring pockets, four on each long side of the curb. The unit was attached to each of the pockets using ten #12x1/2-inch TEK screws. The curb was attached to the 3/4-inch thick steel shake table interface plate with sixteen 3/8-inch diameter Grade 5 bolts, six on each long side of the curb and four on each short side, with each side sharing a bolt on the corners. The bolts were evenly spaced. The shake table interface plate was attached to the shake table platen using M12 threaded rod, spaced approximately 8-inches on-center.

UUT2b Unit Under Test Summary Sheet



Manufacturer: Unitary Product Group

Product Line: York Large Sunline/JCI Series 20

Model Number: ZR300N32N5GZZ1

Product Construction Summary:

Cabinet is constructed of G90 galvanized steel, with powder-coated finish, certified at 1,000 hours salt spray test per ASTM B 117.

Options / Component Summary:

Reheat MagnaDRY, 575V, 25-ton, W-shaped outdoor coil, four OD fans, two scroll compressors, two refrigeration circuits, 15HP IDB motor, VFD with hot gas bypass, VFD manual bypass switch, stainless steel drain pan, 18"x15" blower wheel, eight-tube aluminized gas fired heat exchanger (400MBH).

UUT Properties

Operating Weight (lb)	Dimensions (inches)				Lowest Natural Frequency (Hz)		
	Top Length	Base Length	Width	Height	Front-Back	Side-Side	Vertical
3,340	181	136	92	53	4.0	4.3	7.3

Seismic Test Parameters

Building Code	Test Criteria	Sds	z/h	Ip	Aflx-H	Arig-H	Aflx-V	Arig-V
CBC 2010	2010 ICC-ES AC156	2.00	1.0	1.5	3.2	2.4	1.33	0.53

Note: The UUT was filled with operating fluid for the seismic simulation test and was operational before and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

Unit Mounting Description: Isolated roof curb mount



UUT2b mounted to shake table and ready for test.

UUT2b was tested on a spring-isolated roof curb by ProVent. The curb had ten 10-gage anchoring pockets, four on each long side of the curb and one on each short side. The unit was attached to each of the pockets using five #14x1-1/2-inch TEK screws. The curb was attached to the 3/4-inch thick steel shake table interface plate with twelve 1/2-inch diameter Grade 5 bolts, four on each long side of the curb and two on each short side. The bolts were evenly spaced. The shake table interface plate was attached to the shake table platen using M12 threaded rod, spaced approximately 8-inches on-center.

UUT3a Unit Under Test Summary Sheet



Manufacturer: Unitary Product Group

Product Line: York Large Sunline/JCI Series 20

Model Number: XP180E18A2BAC1

Product Construction Summary:

Cabinet is constructed of G90 galvanized steel, with powder-coated finish, certified at 1,000 hours salt spray test per ASTM B 117.

Options / Component Summary:

Heat pump, 230V, 15-ton, reversing valve assemblies, defrost circuit boards, 18kW 2-stage electric heat section, two OD fans, two scroll compressors, vertical flat fin-tube type OD coils, two refrigeration circuits, 5HP IDB motor, 18"x15" blower wheel, TXVs.

UUT Properties

Operating Weight (lb)	Dimensions (inches)				Lowest Natural Frequency (Hz)		
	Top Length	Base Length	Width	Height	Front-Back	Side-Side	Vertical
2,190	136	136	92	53	6.3	6.0	9.3

Seismic Test Parameters

Building Code	Test Criteria	Sds	z/h	Ip	Aflx-H	Arig-H	Aflx-V	Arig-V
CBC 2010	2010 ICC-ES AC156	2.00	1.0	1.5	3.2	2.4	1.33	0.53

Note: The UUT was filled with operating fluid for the seismic simulation test and was operational before and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

Unit Mounting Description: Rigid roof curb mount



UUT3a mounted to shake table and ready for test.

UUT3a was tested on a rigid roof curb by MicroMetl. The curb had eight 10-gage anchoring pockets, four on each long side of the curb. The unit was attached to each of the pockets using ten #12x1/2-inch TEK screws. The curb was attached to the 3/4-inch thick steel shake table interface plate with sixteen 3/8-inch diameter Grade 5 bolts, six on each long side of the curb and four on each short side, with each side sharing a bolt on the corners. The bolts were evenly spaced. The shake table interface plate was attached to the shake table platen using M12 threaded rod, spaced approximately 8-inches on-center.

UUT3b Unit Under Test Summary Sheet



Manufacturer: Unitary Product Group

Product Line: York Large Sunline/JCI Series 20

Model Number: XP180E18A2BAC1

Product Construction Summary:

Cabinet is constructed of G90 galvanized steel, with powder-coated finish, certified at 1,000 hours salt spray test per ASTM B 117.

Options / Component Summary:

Heat pump, 230V, 15-ton, reversing valve assemblies, defrost circuit boards, 18kW 2-stage electric heat section, two OD fans, two scroll compressors, vertical flat fin-tube type OD coils, two refrigeration circuits, 5HP IDB motor, 18"x15" blower wheel, TXVs.

UUT Properties

Operating Weight (lb)	Dimensions (inches)				Lowest Natural Frequency (Hz)		
	Top Length	Base Length	Width	Height	Front-Back	Side-Side	Vertical
2,190	136	136	92	53	5.5	5.3	8.3

Seismic Test Parameters

Building Code	Test Criteria	Sds	z/h	Ip	Aflx-H	Arig-H	Aflx-V	Arig-V
CBC 2010	2010 ICC-ES AC156	2.00	1.0	1.5	3.2	2.4	1.33	0.53

Note: The UUT was filled with operating fluid for the seismic simulation test and was operational before and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

Unit Mounting Description: Isolated roof curb mount



UUT3b mounted to shake table and ready for test.

UUT3b was tested on a spring-isolated roof curb by ProVent. The curb had ten 10-gage anchoring pockets, four on each long side of the curb and one on each short side. The unit was attached to each of the pockets using five #14x1-1/2-inch TEK screws. The curb was attached to the 3/4-inch thick steel shake table interface plate with twelve 1/2-inch diameter Grade 5 bolts, four on each long side of the curb and two on each short side. The bolts were evenly spaced. The shake table interface plate was attached to the shake table platen using M12 threaded rod, spaced approximately 8-inches on-center.

UUT4a Unit Under Test Summary Sheet

Manufacturer: Unitary Product Group

Product Line: York Large Sunline/JCI Series 20

Model Number: XP240E72N5HZZ1

Product Construction Summary:

Cabinet is constructed of G90 galvanized steel, with powder-coated finish, certified at 1,000 hours salt spray test per ASTM B 117.

Options / Component Summary:

Heat pump, 575V, reversing valve assemblies, defrost circuit boards, Intelli-Comfort BAS communications board, 72kW 2-stage electric heat section, four OD fans, two scroll compressors, W-shaped fin-tube type OD coils, two refrigeration circuits, TXVs, 10HP high static IDB motor.

UUT Properties

Operating Weight (lb)	Dimensions (inches)				Lowest Natural Frequency (Hz)		
	Top Length	Base Length	Width	Height	Front-Back	Side-Side	Vertical
2,690	181	136	92	53	5.0	5.8	8.5

Seismic Test Parameters

Building Code	Test Criteria	Sds	z/h	Ip	Aflx-H	Arig-H	Aflx-V	Arig-V
CBC 2010	2010 ICC-ES AC156	2.00	1.0	1.5	3.2	2.4	1.33	0.53

Note: The UUT was filled with operating fluid for the seismic simulation test and was operational before and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

Unit Mounting Description: Rigid roof curb mount



UUT4a mounted to shake table and ready for test.

UUT4a was tested on a rigid roof curb by MicroMetl. The curb had eight 10-gage anchoring pockets, four on each long side of the curb. The unit was attached to each of the pockets using ten #12x1/2-inch TEK screws. The curb was attached to the 3/4-inch thick steel shake table interface plate with sixteen 3/8-inch diameter Grade 5 bolts, six on each long side of the curb and four on each short side, with each side sharing a bolt on the corners. The bolts were evenly spaced. The shake table interface plate was attached to the shake table platen using M12 threaded rod, spaced approximately 8-inches on-center.

UUT4b Unit Under Test Summary Sheet



Manufacturer: Unitary Product Group

Product Line: York Large Sunline/JCI Series 20

Model Number: XP240E72N5HZZ1

Product Construction Summary:

Cabinet is constructed of G90 galvanized steel, with powder-coated finish, certified at 1,000 hours salt spray test per ASTM B 117.

Options / Component Summary:

Heat pump, 575V, reversing valve assemblies, defrost circuit boards, Intelli-Comfort BAS communications board, 72kW 2-stage electric heat section, four OD fans, two scroll compressors, W-shaped fin-tube type OD coils, two refrigeration circuits, TXVs, 10HP high static IDB motor.

UUT Properties

Operating Weight (lb)	Dimensions (inches)				Lowest Natural Frequency (Hz)		
	Top Length	Base Length	Width	Height	Front-Back	Side-Side	Vertical
2,690	181	136	92	53	4.0	4.0	7.0

Seismic Test Parameters

Building Code	Test Criteria	Sds	z/h	Ip	Aflx-H	Arig-H	Aflx-V	Arig-V
CBC 2010	2010 ICC-ES AC156	2.00	1.0	1.5	3.2	2.4	1.33	0.53

Note: The UUT was filled with operating fluid for the seismic simulation test and was operational before and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

Unit Mounting Description: Isolated roof curb mount



UUT4b mounted to shake table and ready for test.

UUT4b was tested on a spring-isolated roof curb by ProVent. The curb had ten 10-gage anchoring pockets, four on each long side of the curb and one on each short side. The unit was attached to each of the pockets using five #14x1-1/2-inch TEK screws. The curb was attached to the 3/4-inch thick steel shake table interface plate with twelve 1/2-inch diameter Grade 5 bolts, four on each long side of the curb and two on each short side. The bolts were evenly spaced. The shake table interface plate was attached to the shake table platen using M12 threaded rod, spaced approximately 8-inches on-center.

UUT5a Unit Under Test Summary Sheet



Manufacturer: Unitary Product Group

Product Line: York Large Sunline/JCI Series 20

Model Number: ZJ300S32R5BAC1

Product Construction Summary:

Cabinet is constructed of G90 galvanized steel, with powder-coated finish, certified at 1,000 hours salt spray test per ASTM B 117.

Options / Component Summary:

Cooling only, 25-ton, W-shaped outdoor coil, four OD fans, four scroll compressors, four refrigeration circuits, 15HP IDB motor, 18"x15" blower wheel, stainless steel eight tube gas fired heat exchanger (400MBH).

UUT Properties

Operating Weight (lb)	Dimensions (inches)				Lowest Natural Frequency (Hz)		
	Top Length	Base Length	Width	Height	Front-Back	Side-Side	Vertical
3,320	181	136	92	53	5.5	6.8	8.8

Seismic Test Parameters

Building Code	Test Criteria	Sds	z/h	Ip	Aflx-H	Arig-H	Aflx-V	Arig-V
CBC 2010	2010 ICC-ES AC156	2.00	1.0	1.5	3.2	2.4	1.33	0.53

Note: The UUT was filled with operating fluid for the seismic simulation test and was operational before and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

Unit Mounting Description: Rigid roof curb mount



UUT5a mounted to shake table and ready for test.

UUT5a was tested on a rigid roof curb by Ruskin. The curb had twelve 1/8-inch thick anchoring pockets, four on each side of the long direction of the curb and two on each short side. The unit was attached to each of the pockets using two 1/4-20 x 5-inch self-drilling screws. The curb was attached to the 3/4-inch thick steel shake table interface plate with ten 1/2-inch diameter Grade 5 bolts, one-foot in from each corner and one centered on each of the long sides. The shake table interface plate was attached to the shake table platen using M12 threaded rod, spaced approximately 8-inches on-center.

UUT5b Unit Under Test Summary Sheet



Manufacturer: Unitary Product Group

Product Line: York Large Sunline/JCI Series 20

Model Number: ZJ300S32R5BAC1

Product Construction Summary:

Cabinet is constructed of G90 galvanized steel, with powder-coated finish, certified at 1,000 hours salt spray test per ASTM B 117.

Options / Component Summary:

Cooling only, 25-ton, W-shaped outdoor coil, four OD fans, four scroll compressors, four refrigeration circuits, 15HP IDB motor, 18"x15" blower wheel, stainless steel eight tube gas fired heat exchanger (400MBH).

UUT Properties

Operating Weight (lb)	Dimensions (inches)				Lowest Natural Frequency (Hz)		
	Top Length	Base Length	Width	Height	Front-Back	Side-Side	Vertical
3,320	181	136	92	53	3.8	3.5	7.3

Seismic Test Parameters

Building Code	Test Criteria	Sds	z/h	Ip	Aflx-H	Arig-H	Aflx-V	Arig-V
CBC 2010	2010 ICC-ES AC156	2.00	1.0	1.5	3.2	2.4	1.33	0.53

Note: The UUT was filled with operating fluid for the seismic simulation test and was operational before and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

Unit Mounting Description: Isolated roof curb mount



UUT5b mounted to shake table and ready for test.

UUT5b was tested on a spring-isolated roof curb by MicroMetl. The curb had eight 10-gage anchoring pockets, four on each long side of the curb. The unit was attached to each of the pockets using seven #12x1/2-inch TEK screws. The curb was attached to the 3/4-inch thick steel shake table interface plate with twelve 1/2-inch diameter Grade 5 bolts, four on each long side of the curb and two on each short side. The shake table interface plate was attached to the shake table platen using M12 threaded rod, spaced approximately 8-inches on-center.

UUT6a Unit Under Test Summary Sheet

Manufacturer: Unitary Product Group

Product Line: York Large Sunline/JCI Series 20

Model Number: ZF180S24A2BZZ1

Product Construction Summary:

Cabinet is constructed of G90 galvanized steel, with powder-coated finish, certified at 1,000 hours salt spray test per ASTM B 117.

Options / Component Summary:

Cooling only, 15-ton, 5HP IDB motor, two scroll compressors, two OD fans, two refrigeration units, 15"x15" blower wheel, stainless steel six-tube gas-fired heat exchanger (300MBH).

UUT Properties

Operating Weight (lb)	Dimensions (inches)				Lowest Natural Frequency (Hz)		
	Top Length	Base Length	Width	Height	Front-Back	Side-Side	Vertical
2,100	125	125	92	48	8.8	10.0	11.5

Seismic Test Parameters

Building Code	Test Criteria	Sds	z/h	Ip	Aflx-H	Arig-H	Aflx-V	Arig-V
CBC 2010	2010 ICC-ES AC156	2.00	1.0	1.5	3.2	2.4	1.33	0.53

Note: The UUT was filled with operating fluid for the seismic simulation test and was operational before and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

Unit Mounting Description: Rigid roof curb mount



UUT6a mounted to shake table and ready for test.

UUT6a was tested on a rigid roof curb by Ruskin. The curb had twelve 1/8-inch thick anchoring pockets, four on each side of the long direction of the curb and two on each short side. The unit was attached to each of the pockets using two 1/4-20 x 5-inch self-drilling screws. The curb was attached to the 3/4-inch thick steel shake table interface plate with ten 1/2-inch diameter Grade 5 bolts, one-foot in from each corner and one centered on each of the long sides. The shake table interface plate was attached to the shake table platen using M12 threaded rod, spaced approximately 8-inches on-center.

UUT6b Unit Under Test Summary Sheet



Manufacturer: Unitary Product Group

Product Line: York Large Sunline/JCI Series 20

Model Number: ZF180S24A2BZZ1

Product Construction Summary:

Cabinet is constructed of G90 galvanized steel, with powder-coated finish, certified at 1,000 hours salt spray test per ASTM B 117.

Options / Component Summary:

Cooling only, 15-ton, 5HP IDB motor, two scroll compressors, two OD fans, two refrigeration units, 15"x15" blower wheel, stainless steel six-tube gas-fired heat exchanger (300MBH).

UUT Properties

Operating Weight (lb)	Dimensions (inches)				Lowest Natural Frequency (Hz)		
	Top Length	Base Length	Width	Height	Front-Back	Side-Side	Vertical
2,100	125	125	92	48	5.3	5.0	8.0

Seismic Test Parameters

Building Code	Test Criteria	Sds	z/h	Ip	Aflx-H	Arig-H	Aflx-V	Arig-V
CBC 2010	2010 ICC-ES AC156	2.00	1.0	1.5	3.2	2.4	1.33	0.53

Note: The UUT was filled with operating fluid for the seismic simulation test and was operational before and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

Unit Mounting Description: Isolated roof curb mount



UUT6b mounted to shake table and ready for test.

UUT6b was tested on a spring-isolated roof curb by MicroMetl. The curb had eight 10-gage anchoring pockets, four on each long side of the curb. The unit was attached to each of the pockets using seven #12x1/2-inch TEK screws. The curb was attached to the 3/4-inch thick steel shake table interface plate with twelve 1/2-inch diameter Grade 5 bolts, four on each long side of the curb and two on each short side. The shake table interface plate was attached to the shake table platen using M12 threaded rod, spaced approximately 8-inches on-center.

UUT7a



Unit Under Test (UUT) Summary Sheet

Manufacturer: Johnson Controls Incorporated

Product Line: Predator

Model Number: XP078E09A2BAC5

Product Construction Summary:

Cabinet is constructed of G90 galvanized 1,000 hour salt spray (per ASTM-B117) rated powder-coated 20 gage carbon steel wrapper and duct panel with integral corner posts, all attached at the base to four (4) full perimeter 14 gage base rails with #10 sheet metal screws.

Options / Component Summary:

6.5 ton standard heat pump unit with 9kW electric heat section, 230V, finned/tube OD coils, IDB motor, 12"x12" wide blower wheel, fin/tube OD coils, dual scroll type compressors, and dual refrigeration circuits. The unit uses TXV for modulating refrigerant control on both ID/OD coils. A standard controller, standard plastic drain pan, 2" fiberglass TA air filters and dual outdoor fan (ODF) motor deck arrangement were used.

UUT Properties

Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back (X)	Side-Side (Y)	Vertical (Z)
970	89	59	42	12.3	8.3	13.8

Seismic Test Parameters

Building Code	Test Criteria	Sds	z/h	Ip	Aflx-H	Arig-H	Aflx-V	Arig-V
CBC 2010	ICC-ES AC156	2.5	1.0	1.5	4	3	1.67	0.67

Unit Mounting Description:



Note: The UUT was filled with operating fluid for the seismic simulation test and was operational before and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

Description: Unit was mounted to a rigid roof curb supplied by Ruskin. The unit rested on the perimeter of the curb. The curb had (12) 12Ga anchoring pockets, (2) on the each of the short sides of the curb and (4) on each of the long sides of the curb. The unit was attached to each of the pockets using (2) # 14 - 5 inch long self tapping screws. The curb was attached to a 3/4" thick steel plate with (8) 3/8"-dia Gr. 2 bolts. There were two bolts on each side of the unit. The bolts were mounted five inches inward from the edge of the curb flange. The steel plate was attached to the shake table with (22) M12 threaded studs.

UUT7b



Unit Under Test (UUT) Summary Sheet

Manufacturer: Johnson Controls Incorporated

Product Line: Predator

Model Number: XP078E09A2BAC5

Product Construction Summary:

Cabinet is constructed of G90 galvanized 1,000 hour salt spray (per ASTM-B117) rated powder-coated 20 gage carbon steel wrapper and duct panel with integral corner posts, all attached at the base to four (4) full perimeter 14 gage base rails with #10 sheet metal screws.

Options / Component Summary:

6.5 ton standard heat pump unit with 9kW electric heat section, 230V, finned/tube OD coils, IDB motor, 12"x12" wide blower wheel, fin/tube OD coils, dual scroll type compressors, and dual refrigeration circuits. The unit uses TXV for modulating refrigerant control on both ID/OD coils. A standard controller, standard plastic drain pan, 2" fiberglass TA air filters and dual outdoor fan (ODF) motor deck arrangement were used.

UUT Properties

Table with 3 main columns: Weight (lb), Dimensions (inches) (Depth, Width, Height), and Lowest Natural Frequency (Hz) (Front-Back (X), Side-Side (Y), Vertical (Z)).

Seismic Test Parameters

Table with 9 columns: Building Code, Test Criteria, Sds, z/h, Ip, Aflx-H, Arig-H, Aflx-V, Arig-V.

Unit Mounting Description:



Note: The UUT was filled with operating fluid for the seismic simulation test and was operational before and after shaking. The structural integrity of the component attachment system and force-resisting systems was maintained.

Description: Unit was mounted to an isolated roof curb supplied by Ruskin. The unit rested on the perimeter of the curb. The curb had (6) 10Ga anchoring pockets, (2) on the each of the long side of the curb and (1) on each short side. The unit was attached to each of the pockets using (4) # 12 self tapping screws. The curb was attached to a 3/4" thick steel plate with (8) 3/8"-dia Gr. 5 bolts. The bolts were spaced 5-inches in from each side of the curb. The steel plate was attached to the shake table with (12) M12 threaded studs.

Special Seismic Certification
Approved Components



Manufacturer: Unitary Product Group

Product Line: Unitary Product Group Packaged Rooftop Units (UPG); JCI Series 20-York Large Sunline

Compressors			
<i>Model Number</i>	<i>Manufacturer</i>	<i>Description</i>	<i>Unit</i>
HLJ072T 3	Danfoss	Refrigerant Compressor Sys. #1, 200/230V - 3ph	6
HLJ072T 4	Danfoss	Refrigerant Compressor Sys. #1, 460V - 3ph	Interpolated
HLJ072T 7	Danfoss	Refrigerant Compressor Sys. #1, 575V - 3ph	Interpolated
HLJ083T 3	Danfoss	Refrigerant Compressor Sys. #2, 200/230V - 3ph	3, 6
HLJ083T 4	Danfoss	Refrigerant Compressor Sys. #2, 460V - 3ph	Interpolated
HLJ083T 7	Danfoss	Refrigerant Compressor Sys. #2, 575V - 3ph	Interpolated
SH090A 3	Danfoss	Refrigerant Compressor, 200/230V - 3ph	Interpolated
SH090A 4	Danfoss	Refrigerant Compressor, 460 - 3ph	Interpolated
SH090A 7	Danfoss	Refrigerant Compressor, 575V - 3ph	Interpolated
SH120A 3	Danfoss	Refrigerant Compressor, 200/230V - 3ph	Interpolated
SH120A 4	Danfoss	Refrigerant Compressor, 460 - 3ph	Interpolated
SH120A 7	Danfoss	Refrigerant Compressor, 575V - 3ph	Interpolated
SH140A 3	Danfoss	Refrigerant Compressor, 200/230V - 3ph	Interpolated
SH140A 4	Danfoss	Refrigerant Compressor, 460 - 3ph	Interpolated
SH140A 7	Danfoss	Refrigerant Compressor, 575V - 3ph	Interpolated
H83C363DB D	Bristol	Refrigerant Compressor, 200/230V - 3ph	7
H83C383DB D	Bristol	Refrigerant Compressor, 200/230V - 3ph	Interpolated
H83C383DB V	Bristol	Refrigerant Compressor, 460V - 3ph	Interpolated
H83C383DB F	Bristol	Refrigerant Compressor, 575V - 3ph	Interpolated
H83R443DB D	Bristol	Refrigerant Compressor, 200/230V - 3ph	Interpolated
H83R443DB V	Bristol	Refrigerant Compressor, 460V - 3ph	Interpolated
H83R443DB F	Bristol	Refrigerant Compressor, 575V - 3ph	Interpolated
H83R513DB D	Bristol	Refrigerant Compressor, 200/230V - 3ph	Interpolated
H83R513DB V	Bristol	Refrigerant Compressor, 460V - 3ph	Interpolated
H83R513DB F	Bristol	Refrigerant Compressor, 575V - 3ph	Interpolated
H83R683DB D	Bristol	Refrigerant Compressor, 200/230V - 3ph	Interpolated
H83R683DB V	Bristol	Refrigerant Compressor, 460V - 3ph	Interpolated
H83R683DB F	Bristol	Refrigerant Compressor, 575V - 3ph	5
ZP83KCE TF5	Copeland	Refrigerant Compressor, 200/230V - 3ph	1
ZP83KCE TFD	Copeland	Refrigerant Compressor, 460V - 3ph	Interpolated
ZP83KCE TFE	Copeland	Refrigerant Compressor, 575V - 3ph	Interpolated
ZP103KCE TF5	Copeland	Refrigerant Compressor, 200/230V - 3ph	Interpolated
ZP103KCE TFD	Copeland	Refrigerant Compressor, 460V - 3ph	Interpolated
ZP103KCE TFE	Copeland	Refrigerant Compressor, 575V - 3ph	Interpolated
ZP137KCE TF5	Copeland	Refrigerant Compressor, 200/230V - 3ph	Interpolated
ZP137KCE TFD	Copeland	Refrigerant Compressor, 460V - 3ph	Interpolated
ZP137KCE TFE	Copeland	Refrigerant Compressor, 575V - 3ph	2
ZP120KCE TF5	Copeland	Refrigerant Compressor, 200/230V - 3ph	Interpolated
ZP120KCE TFD	Copeland	Refrigerant Compressor, 460V - 3ph	Interpolated
ZP120KCE TFE	Copeland	Refrigerant Compressor, 575V - 3ph	4

Special Seismic Certification
Approved Components



Manufacturer: Unitary Product Group

Product Line: Unitary Product Group Packaged Rooftop Units (UPG); JCI Series 20-York Large Sunline

Outdoor Fan Motors			
<i>Model Number</i>	<i>Manufacturer</i>	<i>Description</i>	<i>Unit</i>
71	Fasco	1/3 HP (208/30V)	Interpolated
71	Fasco	1/3 HP (460V)	Interpolated
71	Fasco	1/3 HP (575V)	2,5
F48R	AO Smith	1/3 HP (208/230V)	1
F48R	AO Smith	1/3 HP (460V)	Interpolated
F48R	AO Smith	1/3 HP (575V)	Interpolated
F48AE	AO Smith	1/2 HP (208/230V)	Interpolated
F48AE	AO Smith	1/2 HP (460V)	Interpolated
F48AE	AO Smith	1/2 HP (575V)	4
#1935	AO Smith	1-1/4 HP (208/230V)	3,6
#1935	AO Smith	1-1/4 HP (460V)	Interpolated
#1935	AO Smith	1-1/4 HP (575V)	Interpolated

Options: ODF Blades - Lau A15 & A18, ODF Grilles - Premier

Outdoor Coils			
<i>Model Number</i>	<i>Manufacturer</i>	<i>Description (Total Sq Ft x Rows x Qty)</i>	<i>Unit</i>
339316	JCI	Outdoor Coil, 19 x 3 x 1	6
339617	JCI	Outdoor Coil, 19 x 3 x 1	6
68631	JCI	Outdoor Coil, 21.6 x 3 x 1	Interpolated
68630	JCI	Outdoor Coil, 21.6 x 3 x 1	Interpolated
445398	JCI	Outdoor Coil, 21.6 x 3 x 1	Interpolated
445399	JCI	Outdoor Coil, 21.6 x 3 x 1	Interpolated
1664402	JCI	Outdoor Coil, 15.9 x 2 x 2	5
1664403	JCI	Outdoor Coil, 15.9 x 2 x 2	5
84568	JCI	Outdoor Coil, 15.9 x 2 x 2	1, 2
84569	JCI	Outdoor Coil, 15.9 x 2 x 2	1, 2
544235	JCI	Outdoor Coil, 31.9 x 2 x 1	3
544239	JCI	Outdoor Coil, 31.9 x 2 x 1	3
85049	JCI	Outdoor Coil, 15.9 x 2 x 4	4

Special Seismic Certification
Approved Components



Manufacturer: Unitary Product Group

Product Line: Unitary Product Group Packaged Rooftop Units (UPG); JCI Series 20-York Large Sunline

Indoor Coils			
340735	JCI	15.5 Total Square feet-4 Row JCI #340735 fin/tube	6
335371	JCI	20 Total Square feet- 4 Row JCI #335371 fin/tube	Interpolated
271576	JCI	20 Total Square feet - 3 row JCI #271576 fin/tube	1
84680	JCI	20 Total square feet - 4 Row JCI #84680 fin/tube	Interpolated
546534	JCI	20 Total Suare feet - 4 Row JCI #546534 fin/tube	3
84660	JCI	20.52 Total Square - 4 Row JCI #84660 fin/tube	2
83318, 83322	JCI	25 Total Square feet - 4 Row Upper - JCI #83318 fin/tube Lower - JCI #83322 fin/tube	Interpolated
335373, 335374	JCI	25 Total Square feet - 4 Row Upper - JCI #335373 fin/tube Lower - JCI #335374 fin/tube	Interpolated
166299, 166298	JCI	25 Total Square feet - 4 Row Upper - JCI #166299fin/tube Lower - JCI #166298 fin/tube	Interpolated
168192, 168191	JCI	25 Total Square feet - 4 Row Upper - JCI #168192 fin/tube Lower - JCI #168191 fin/tube	Interpolated
168180, 168179	JCI	25 Total Square feet - 4 Row Upper JCI #168180 fin/tube Lower - JCI #168179 fin/tube	Interpolated
163917, 163918	JCI	25 Total Square feet - 4 Row Upper - JCI #163917 fin/tube Lower - JCI #163918 fin/tube	5
84967, 84983	JCI	25 Total Square feet - 4 Row Upper JCI #84967 fin/tube Lower JCI #84983 fin/tube	4

Thermostatic Expansion Valves			
<i>Model Number</i>	<i>Manufacturer</i>	<i>Description</i>	<i>Unit</i>
BBIZE	Sporlan	1/2"	1, 2, 3, 4, 5
BBIZE	Sporlan	3/8"	Interpolated
#22-7-3/16" caps	Parker Hannifin	3/8"	6

**Special Seismic Certification
Approved Components**



Manufacturer: Unitary Product Group

Product Line: Unitary Product Group Packaged Rooftop Units (UPG); JCI Series 20-York Large Sunline

Indoor Blower Motor			
<i>Model Number</i>	<i>Manufacturer</i>	<i>Description</i>	<i>Unit</i>
184T	AO Smith	5 HP (208/230/460/575V)	1, 3, 6
213T	AO Smith	7.5 HP (208/230/460/575V)	Interpolated
215T	Baldor	10 HP (208/230/460/575V)	4
254T	AO Smith	15 HP (208/230/460/575V)	2, 5

VAV for Indoor Blower Motor			
<i>Model Number</i>	<i>Manufacturer</i>	<i>Description</i>	<i>Unit</i>
GVX005A1-2	Eaton	5 HP 208/230V 3 phase	1
GVX005A1-4	Eaton	5 HP 460V 3 phase	Interpolated
GVX005A1-5	Eaton	5 HP 575V 3 phase	Interpolated
GVX0075A1-2	Eaton	7.5 HP 208/230V 3 phase	Interpolated
GVX0075A1-4	Eaton	7.5 HP 460V 3 phase	Interpolated
GVX0075A1-5	Eaton	7.5 HP 575V 3 phase	Interpolated
GVX010A1-2	Eaton	10 HP 208/230V 3 phase	Interpolated
GVX010A1-4	Eaton	10 HP 460V 3 phase	Interpolated
GVX010A1-5	Eaton	10 HP 575V 3 phase	Interpolated
GVX015A1-2	Eaton	15 HP 208/230V 3 phase	Interpolated
GVX015A1-4	Eaton	15 HP 460V 3 phase	Interpolated
GVX015A1-5	Eaton	15 HP 575V 3 phase	2

Economizer			
<i>Model Number</i>	<i>Manufacturer</i>	<i>Description</i>	<i>Unit</i>
JCI 2EE04703924	JCI	Horizontal Economizer	6
JCI 2EE04703824	JCI	Horizontal Economizer	1, 2, 3, 4, 5
JCI 2MD04702824	JCI	2-Position Economizer	6
JCI 2MD04702624	JCI	2-Position Economizer	1, 2, 3, 4, 5

Electric Heater			
<i>Model Number</i>	<i>Manufacturer</i>	<i>Description</i>	<i>Unit</i>
E18 kW	Tutco	18 kW (208/230V, 460V, or 575V -3ph)	3
E24 kW	Tutco	24 kW (208/230V, 460V, or 575V -3ph)	Interpolated
E36 kW	Tutco	36 kW (208/230V, 460V, or 575V -3ph)	Interpolated
E54 kW	Tutco	54 kW (208/230V, 460V, or 575V -3ph)	4

Special Seismic Certification Approved Components



Manufacturer: Unitary Product Group

Product Line: Unitary Product Group Packaged Rooftop Units (UPG); JCI Series 20-York Large Sunline

Heat Cells (Heat Type and Nominal Heat Capacity)			
Model Number	Manufacturer	Description	Unit
N24	JCI	240 MBH Output, Aluminized Steel, Dual Stage	1
N32	JCI	320 MBH Output, Aluminized Steel, Dual Stage	2
S24	JCI	240 MBH Output, Stainless Steel, Dual Stage	5
S32	JCI	320 MBH Output, Stainless Steel, Dual Stage	6

Filters			
Model Number	Manufacturer	Description	Unit
198, 12" x 24"	AAF	2" Fiberglass TA Filter	4, 5
198, 16" x 20"	AAF	2" Fiberglass TA Filter	1, 2, 3
198, 16" x 25"	AAF	2" Fiberglass TA Filter	1, 2, 3
198, 18" x 24"	AAF	2" Fiberglass TA Filter	6
AmAir 300X, 12" x 24"	AAF	2" Pleated TA Filter	4, 5
AmAir 300X, 16" x 20"	AAF	2" Pleated TA Filter	1, 2, 3
AmAir 300X, 16" x 25"	AAF	2" Pleated TA Filter	1, 2, 3
AmAir 300X, 18" x 24"	AAF	2" Pleated TA Filter	6
AmAir 1300, 12" x 24"	AAF	4" Pleated TA Filter	4, 5
AmAir 1300, 16" x 20"	AAF	4" Pleated TA Filter	1, 2, 3
AmAir 1300, 16" x 25"	AAF	4" Pleated TA Filter	1, 2, 3
AmAir 1300, 18" x 24"	AAF	4" Pleated TA Filter	6

Miscellaneous			
Model Number	Manufacturer	Description	Unit
JCI P226	JCI	Outdoor Fan Speed Controller	1, 2
JCI P32AF-2C	JCI	Dirty Filter Switch	1, 2, 3, 4, 5, 6
CY017/032/040	Advanced Control	VFD Manual Bypass Switch	1, 2, 3, 4, 5, 6
FAL/KAL/KDL	Square D	Electrical Disconnect Switch	1, 2, 3, 4, 5, 6
AE 00401	Ayrshire	Simplicity 1A G/E Board Controller	1, 2, 5, 6
AE 00501	Ayrshire	Simplicity 1A HP Board Controller	3, 4
AE 00601	Ayrshire	ZI/ZW - Four compressor expansion board	5
UT 1084-900	United Technologies	Defrost Control Board	3, 4
UT 1160-1	United Technologies	Reheat Control Board	1, 2
STF-04U	Saginomiya	Reversing Heat Valve	3
STF-07U	Saginomiya	Reversing Heat Valve	4
PA5083	Parker Hannifin	Suction Line Accumulator	3,4
1159-10	United Technologies	ItelliComfort Board	3, 4, 5, 6
AE 01206	Ayrshire	VAV Board	1, 2
JCI #433716	JCI	Smoke Detector, Supply	1, 2, 3, 4, 5, 6
JCI #433717	JCI	Smoke Detector, Return	1, 2, 3, 4, 5, 6