



DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION  
OFFICE OF STATEWIDE HOSPITAL PLANNING AND DEVELOPMENT

APPLICATION FOR HCAI SPECIAL SEISMIC  
CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0838

HCAI Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: Johnson Controls

Manufacturer's Technical Representative: Ken Zhu

Mailing Address: 5000 Renaissance Drive, New Freedom, PA 17349

Telephone: (717) 668-2906

Email: ken.yu.zhu@jci.com

Product Information

Product Name: YVWH - Screw Chiller and Heat Pump

Product Model Number(s): YVWH450PC66A22VAX

Product Category: Chillers

Product Sub-Category: Chillers - Water Cooled

General Description: Welded carbon steel evaporator and condenser vessels with compressors, motors, VSD, and controller.

Mounting Description: Base Mounted Spring and Neoprene Vibration Isolated -

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

Applicant Information

Applicant Company Name: Manwill Engineering LLC

Contact Person: Derek Manwill

Mailing Address: PO Box 1194, Bend, OR 97709

Telephone: (541) 241-2102

Email: derek@manwillse.com

Title: President



**DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION  
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**California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)**

Company Name: MANWILL ENGINEERING LLC

Name: Derek Manwill

California License Number: S6266

Mailing Address: PO Box 1194, Bend, OR 97709

Telephone: (541) 241-2102

Email: derek@manwillse.com

**Certification Method**

☐ GR-63-Core

☒ ICC-ES AC156

☐ IEEE 344

☐ IEEE 693

☐ NEBS 3

☐ Other (Please Specify): \_\_\_\_\_

**Testing Laboratory**

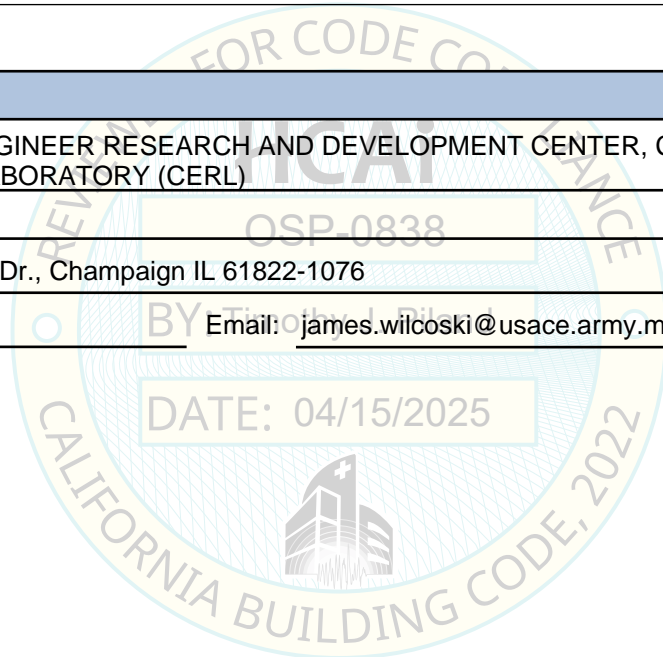
Company Name: U.S. ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER, CONSTRUCTION ENGINEERING  
RESEARCH LABORATORY (CERL)

Contact Person: James Wilcoski

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Email: james.wilcoski@usace.army.mil





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Seismic Parameters

Design Basis of Equipment or Components ( $F_p/W_p$ ) = 3.94 (SDS=1.75,  $z/h=1$ ), 1.88 (SDS=2.50,  $z/h=0$ )

SDS (Design spectral response acceleration at short period,  $g$ ) = 1.75 ( $z/h=1$ ), 2.50 ( $z/h=0$ )

$a_p$  (Amplification factor) = 2.5

$R_p$  (Response modification factor) = 2.0 (2.5 for neoprene)

$\Omega_0$  (System overstrength factor) = 2.0

$I_p$  (Importance factor) = 1.5

$z/h$  (Height ratio factor) = 1 and 0

Natural frequencies (Hz) = See Attachment

Overall dimensions and weight = See Attachment

HCAI Approval (For Office Use Only) - Approval Expires on 04/15/2031

Date: 4/15/2025

Name: Timothy Piland

Title: Senior Structural Engineer

Special Seismic Certification Valid Up to: SDS ( $g$ ) = See Above

$z/h$  = See Above

Condition of Approval (if applicable):

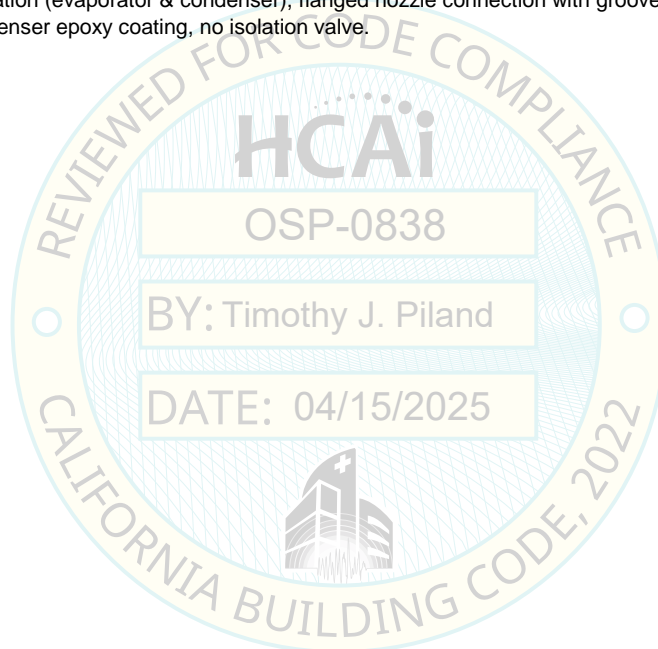
**JOHNSON CONTROLS**  
**YVWH - Screw Chiller and Heat Pump**

**TABLE 1**

Model Number	Dimensions (in)			Max. Wt. (lb)	Description / Notes	Basis
	Depth	Width	Height			
YVWH - Screw Chiller and Heat Pump						
YVWH450PC66A22VAX	86.0	144.0	98.0	23,350		UUT 1
Mounting: Base Mounted Spring and Neoprene Vibration Isolated				Seismic Levels:	S <sub>DS</sub> = 1.75g for z/h = 1 S <sub>DS</sub> = 2.50g for z/h = 0	I <sub>P</sub> = 1.5

**Product Construction:** Welded carbon steel vessels. NEMA 1 carbon steel electrical panels. Copper tubes.

**Options/Subcomponents:** Since only one unit was tested, variations are not allowed. The following option selections are required:  
460V/60Hz, 150psi, 19mm insulation (evaporator & condenser), flanged nozzle connection with grooved nozzle extension, 2-pass, compact water boxes, no hinges, no condenser epoxy coating, no isolation valve.



**JOHNSON CONTROLS  
YVWH - Screw Chiller and Heat Pump**

**TABLE 2. SUBCOMPONENTS**

Model Number	Dimensions (in)			Max. Wt. (lb)	Description / Notes	Basis
	Depth	Width	Height			
Type: Evaporator - Mfr: Johnson Controls						
Evaporator-YVWH450	144.0	36.6	90.0	6,486		UUT 1
Type: Condenser - Mfr: Johnson Controls						
Condenser-YVWH450	144.0	40.9	48.9	8,077		UUT 1
Type: Compressor - Mfr: Johnson Controls						
GT205s-BVUT46/50	61.0	27.0	23.5	2,403		UUT 1
GT233s-BVUY46/50	73.0	28.0	28.2	3,302		UUT 1
Type: VSD - Mfr: Inovance						
YGV-0555BN-2-66AI	83.0	16.0	51.0	1,117		UUT 1
Type: Controller - Mfr: Johnson Controls						
YVWH450ETL	22.0	10.0	24.5	84		UUT 1

**Mounting:** Mounted within unit.

**Seismic  
Levels:**

$S_{DS} = 1.75g$  for  $z/h = 1$   
 $S_{DS} = 2.50g$  for  $z/h = 0$

$I_p = 1.5$

**Construction/Options:** Model number uniquely identifies manufacturer, materials, and configuration of subcomponents.

BY: Timothy J. Piland

DATE: 04/15/2025



## ATTACHMENT 2: UNIT UNDER TEST SUMMARIES

## SPECIAL SEISMIC CERTIFICATION

### UUT 1A - Pads

Manufacturer: Johnson Controls  
Model number: YVWH450PC66A22VAX  
Unit function: Screw Chiller and Heat Pump  
Serial number: 50612K12742554

Dimensions (in)			Weight (lb)	Res. Freq. (Hz)		
Depth	Width	Height		F-B	S-S	V
86.0	144.0	98.0	23,350	8.1	6.0	28.5

Code & criteria: 2022 CBC, ICC-ES AC156

Test laboratory: US Army ERDC-CERL

Report: 24024TR1.1 (dated 3-19-25), tested on 12-9-24

S <sub>DS</sub> (g)	z/h	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)
1.75	1.00	2.80	2.10	1.68	0.68
2.50	0.00				

Importance Factor,  $I_p = 1.5$ : Unit was full of operating content during the shake table test. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.

**Mounting:** Base mounted neoprene vibration isolated. UUT was mounted on (4) Mason neoprene pad assemblies (P/N 028-12849-000) with a total of (8) 1-1/4-in Grade 8 bolts (2 per pad). Pad assembly consists of: 15x8x3/8-in A36 plate on 14x7x3/4-in 60 duro neoprene pad, bolt goes through steel sleeve that sits inside neoprene sleeve, bolt head rests on structural washer and 4-in OD x 1/4-in thick washer which sits on 1/4-in neoprene washer.

**Construction:** Welded carbon steel vessels. NEMA 1 carbon steel electrical panels. Copper tubes.  
The following options were selected for the test unit: 460V/60Hz, 150psi, 19mm insulation (evaporator & condenser), flanged nozzle connection with grooved nozzle extension, 2-pass, compact water boxes, no hinges, no condenser epoxy coating, no isolation valve.

**Subcomponents:** Johnson Controls - Evaporator (Evaporator-YVWH450), Johnson Controls - Condenser (Condenser-YVWH450), Johnson Controls - Compressor (GT205s-BVUT46/50, GT233s-BVUY46/50), Inovance - VSD (YGV-0555BN-2-66AI), Johnson Controls - Controller (YVWH450ETL).

**Testing notes:** UUT 1A and UUT 1B are the same physical unit with different mounting.  
Testing at non-accredited laboratory meets the requirements of PIN 58 Item #16.



## ATTACHMENT 2: UNIT UNDER TEST SUMMARIES

## SPECIAL SEISMIC CERTIFICATION

### UUT 1B - Springs

Manufacturer: Johnson Controls  
Model number: YVWH450PC66A22VAX  
Unit function: Screw Chiller and Heat Pump  
Serial number: 50612K12742554

Dimensions (in)			Weight (lb)	Res. Freq. (Hz)		
Depth	Width	Height		F-B	S-S	V
86.0	144.0	98.0	23,350	2.4	3.0	6.1

Code & criteria: 2022 CBC, ICC-ES AC156

Test laboratory: US Army ERDC-CERL

Report: 24024TR1.1 (dated 3-19-25), tested on 12-10-24

S <sub>DS</sub> (g)	z/h	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)
1.75	1.00	2.80	2.10	1.68	0.68
2.50	0.00				

Importance Factor,  $I_p = 1.5$ : Unit was full of operating content during the shake table test. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.

**Mounting:** Base mounted spring vibration isolated. UUT was mounted on (4) Mason spring isolators (SLFADA600-2-111) with a total of (16) 1-in Grade 5 bolts (4 per isolator). Each spring isolator was bolted to the test fixture with (8) 1-in Grade 8 bolts (36 total).

**Construction:** Welded carbon steel vessels. NEMA 1 carbon steel electrical panels. Copper tubes.  
The following options were selected for the test unit: 460V/60Hz, 150psi, 19mm insulation (evaporator & condenser), flanged nozzle connection with grooved nozzle extension, 2-pass, compact water boxes, no hinges, no condenser epoxy coating, no isolation valve.

**Subcomponents:** Johnson Controls - Evaporator (Evaporator-YVWH450), Johnson Controls - Condenser (Condenser-YVWH450), Johnson Controls - Compressor (GT205s-BVUT46/50, GT233s-BVUY46/50), Inovance - VSD (YGV-0555BN-2-66AI), Johnson Controls - Controller (YVWH450ETL).

**Testing notes:** UUT 1A and UUT 1B are the same physical unit with different mounting.  
Testing at non-accredited laboratory meets the requirements of PIN 58 Item #16.

