



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

**APPLICATION FOR OSHPD SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)**

OFFICE USE ONLY

APPLICATION #: OSP – 0045-10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: Johnson Controls, Inc.

Manufacturer's Technical Representative: Don Angstadt

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

Telephone: 717.771.6122

Email: donald.m.angstadt@jci.com

Product Information

Product Name: YK Centrifugal Liquid Chillers

Product Type: Centrifugal Chiller

Product Model Number: See Attachment 1

(List all unique product identification numbers and/or part numbers)

General Description: Welded carbon steel evaporator and condenser vessels with compressor, motor, VSD, oil sump, and controller. Seismic enhancements made to the test units shall be incorporated into the production units.

Mounting Description: Neoprene pad floor mounted

Applicant Information

Applicant Company Name: Manwill Engineering LLC


Contact Person: Derek Manwill, SE

Mailing Address: PO Box 1194, Bend, OR 97709

Telephone: 541.241.2102

Email: derek@manwillSE.com

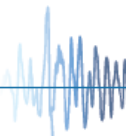
I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2016.

Signature of Applicant: 

Date: 4/1/2019

Title: President

Company Name: Manwill Engineering LLC





**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION**

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

Company Name: Manwill Engineering LLC
Name: Derek Manwill, SE California License Number: S6266
Mailing Address: PO Box 1194, Bend, OR 97709
Telephone: 541.241.2102 Email: derek@manwillSE.com

Supports and Attachments Preapproval

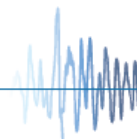
- Supports and attachments are preapproved under OPM- _____
(Separate application for OSHPD Preapproval of Manufacturer's Certification (OPM) of Supports and attachments is required)
- Supports and attachments are not preapproved

Certification Method

- Testing in accordance with: ICC-ES AC156
- Other (Please Specify): _____

Testing Laboratory

Company Name: U.S. Army ERDC – Civil Engineering Research Laboratory
Contact Name: Jim Wilcoski
Mailing Address: 2902 Newmark Drive, Champaign, IL 61826
Telephone: 217.373.6763 Email: james.wilcoski@usace.army.mil





**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION**

Seismic Parameters

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

Design Basis of Equipment or Components (F_p/W_p) = 3.33 ($S_{DS} = 1.85$); 1.50 ($S_{DS} = 2.50$)

S_{DS} (Design spectral response acceleration at short period, g) = 1.85 ($z/h = 1$); 2.50 ($z/h = 0$)

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

R_p (Equipment or component response modification factor) = 2.5

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1 ($S_{DS} = 1.85$); 0 ($S_{DS} = 2.50$)

Equipment or Component Natural Frequencies (Hz) = See Attachment 2

Overall dimensions and weight (or range thereof) = See Attachments 1 & 2

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): Attachments 1, 2, & 3

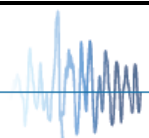
OSHPD Approval (For Office Use Only) – Approval Expires on December 31, 2022

Signature: *Sonia Eliseo* Date: June 10, 2019

Print Name: Sonia Eliseo Title: SSE

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

Condition of Approval (if applicable): _____



ATTACHMENT 1: CERTIFIED COMPONENTS

SEISMIC COMPLIANCE REPORT

TABLE 1

DOCUMENT NO.: 17033CR1.1

| MANUFACTURER: JOHNSON CONTROLS, INC. | | | | | | |
|--|--|-------|--------|------------------|---------------------|--------|
| PRODUCT FAMILY: YK CENTRIFUGAL CHILLERS | | | | | | |
| MODEL NUMBER | DIMENSIONS (in) | | | MAX. WT. (lb) | DESCRIPTION / NOTES | BASIS |
| | DEPTH | WIDTH | HEIGHT | | | |
| YK Centrifugal Chillers | | | | | | |
| YK2112*2112*Q3-**HS | 182.8 | 60.0 | 100.0 | 16000 | | EXTRAP |
| YK2112X2112SQ4-ELHS | 176.0 | 69.0 | 87.0 | 16500 | | UUT 1 |
| YK2112*2112*Q4-**HS | 176.0 | 69.0 | 87.0 | 16500 | | INTERP |
| YK2512*2112*Q3-**GS | 182.8 | 61.0 | 97.3 | 17500 | | INTERP |
| YK2512*2512*Q3-**HS | 183.0 | 62.0 | 103.0 | 19630 | | INTERP |
| YK2512*2512*Q4-**HS | 183.0 | 62.0 | 101.0 | 19700 | | INTERP |
| YK2512*2512*Q5-**HS | 183.0 | 62.0 | 107.0 | 20200 | | INTERP |
| YK2512*2512*Q6-**HS | 183.0 | 62.0 | 106.0 | 20400 | | INTERP |
| YK2512*2512*Q7-**HS | 183.0 | 62.0 | 106.0 | 20600 | | INTERP |
| YK2912*2512*Q5-**HS | 190.8 | 66.0 | 109.0 | 22800 | | INTERP |
| YK2912*2512*Q6-**HS | 190.8 | 66.0 | 106.0 | 23000 | | INTERP |
| YK2912*2512*Q3-**GS | 190.5 | 66.0 | 101.0 | 23000 | | INTERP |
| YK2912*2512*Q4-**GS | 190.5 | 66.0 | 96.0 | 23000 | | INTERP |
| YK2912*2512*Q7-**HS | 190.8 | 66.0 | 108.0 | 23200 | | INTERP |
| YK2912*2512*Q5-**GS | 190.5 | 66.0 | 99.8 | 23500 | | INTERP |
| YK2912*2912*Q5-**HS | 190.8 | 70.0 | 113.0 | 24600 | | INTERP |
| YK2912*2912*Q6-**HS | 190.8 | 70.0 | 115.0 | 24800 | | INTERP |
| YK2912*2912*Q7-**HS | 190.8 | 70.0 | 114.0 | 25000 | | INTERP |
| YK2916*2516*Q4-**GS | 238.5 | 66.0 | 96.0 | 26300 | | INTERP |
| YK2916*2516*Q5-**GS | 238.5 | 66.0 | 96.0 | 26800 | | INTERP |
| YK3312*2912*Q7-**GS | 196.5 | 74.0 | 107.4 | 28700 | | INTERP |
| YK3312*2912*Q5-**GS | 196.5 | 74.0 | 106.3 | 28800 | | INTERP |
| YK3312*2912*Q6-**GS | 196.5 | 74.0 | 110.5 | 28800 | | INTERP |
| YK3312*2912*P8-**HS | 196.8 | 76.4 | 126.0 | 32000 | | INTERP |
| YK3316*2916*Q7-**GS | 244.5 | 74.0 | 107.4 | 32700 | | INTERP |
| YK3312*2912*P9-**HS | 196.8 | 76.4 | 123.0 | 32800 | | INTERP |
| YK3316*2916*Q5-**GS | 244.5 | 74.0 | 96.0 | 32800 | | INTERP |
| YK3316*2916*Q6-**GS | 244.5 | 74.0 | 110.5 | 32800 | | INTERP |
| YK3912*2912*P8-**HS | 197.5 | 85.0 | 128.0 | 33500 | | INTERP |
| YK3314*2914*P8-**HS | 220.8 | 76.4 | 126.0 | 33800 | | INTERP |
| YK3912*2912*P9-**GS | 197.3 | 83.0 | 126.0 | 33900 | | INTERP |
| YK3912*2912*P8-**GS | 197.3 | 83.0 | 126.0 | 34000 | | INTERP |
| YK3912*2912*P9-**HS | 197.5 | 85.0 | 125.0 | 34300 | | INTERP |
| YK3314*2914*P9-**HS | 220.8 | 76.4 | 123.0 | 34600 | | INTERP |
| YK3914*2914*P8-**HS | 221.5 | 85.0 | 128.0 | 34800 | | INTERP |
| YK3914*2914*P9-**HS | 221.5 | 85.0 | 125.0 | 35600 | | INTERP |
| YK3914*3314*P8-**HS | 221.5 | 85.0 | 128.0 | 35700 | | INTERP |
| YK3914*3314*P9-**HS | 221.5 | 85.0 | 125.0 | 36300 | | INTERP |
| YK3916*3314*P9-**HS | 245.5 | 85.0 | 125.0 | 36300 | | INTERP |
| YK3916*2916*P8-**GS | 245.3 | 83.0 | 126.0 | 38300 | | INTERP |
| YK3916*2916*P9-**GS | 245.3 | 83.0 | 126.0 | 38400 | | INTERP |
| YK3916*3316*P8-**HS | 245.5 | 85.0 | 128.0 | 39200 | | INTERP |
| NOTES: | Table continues on the next page. Additional notes, information, and seismic parameters are shown at the end of the table. | | | | | |

ATTACHMENT 1: CERTIFIED COMPONENTS

SEISMIC COMPLIANCE REPORT

TABLE 1 (continued)

DOCUMENT NO.: 17033CR1.1

| MANUFACTURER: JOHNSON CONTROLS, INC. | | | | | | |
|--|--|-------|--------|------------------|---------------------|--------|
| PRODUCT FAMILY: YK CENTRIFUGAL CHILLERS | | | | | | |
| MODEL NUMBER | DIMENSIONS (in) | | | MAX. WT. (lb) | DESCRIPTION / NOTES | BASIS |
| | DEPTH | WIDTH | HEIGHT | | | |
| YK Centrifugal Chillers (continued) | | | | | | |
| YK3314*2914*H9-**HS | 220.8 | 76.4 | 119.0 | 40000 | | INTERP |
| YK3914*3314*H9-**HS | 221.5 | 88.0 | 122.0 | 42800 | | INTERP |
| YK4414*3314*H9-**GS | 224.0 | 90.5 | 129.0 | 43200 | | INTERP |
| YK4214*3314*H9-**GS | 224.0 | 90.5 | 129.0 | 44300 | | INTERP |
| YK3914*3314*K1-**HS | 221.5 | 88.0 | 122.0 | 44600 | | INTERP |
| YK3916*3316*H9-**HS | 245.5 | 88.0 | 122.0 | 45200 | | INTERP |
| YK4214*3314*K1-**HS | 224.5 | 90.8 | 127.0 | 45600 | | INTERP |
| YK4214*3314*K2-**HS | 224.5 | 90.8 | 128.0 | 45800 | | INTERP |
| YK4214*3314*K1-**GS | 224.0 | 90.5 | 120.0 | 45800 | | INTERP |
| YK3916*3316*K1-**HS | 245.5 | 88.0 | 122.0 | 47000 | | INTERP |
| YK4414*3914*H9-**HS | 224.5 | 98.8 | 125.0 | 47500 | | INTERP |
| YK4216*3316*K1-**HS | 248.5 | 90.8 | 127.0 | 48300 | | INTERP |
| YK4216*3316*K2-**HS | 248.5 | 90.8 | 128.0 | 48500 | | INTERP |
| YK4416*3916*H9-**HS | 248.5 | 98.8 | 125.0 | 51800 | | INTERP |
| YK4414*3914*K1-**HS | 224.5 | 98.8 | 128.0 | 52000 | | INTERP |
| YK4414*3914*K2-**HS | 224.5 | 98.8 | 129.0 | 52200 | | INTERP |
| YK4814*3914*H9-**GS | 229.4 | 111.0 | 136.0 | 56100 | | INTERP |
| YK4416*3916*K1-**HS | 248.5 | 98.8 | 128.0 | 56600 | | INTERP |
| YK4416*3916*K2-**HS | 248.5 | 98.8 | 129.0 | 56800 | | INTERP |
| YK4814*3914*K1-**GS | 229.4 | 111.0 | 132.0 | 57500 | | INTERP |
| YK4814*3914*K2-**GS | 229.4 | 103.0 | 132.0 | 57700 | | INTERP |
| YK4416*3916*K3-**HS | 248.5 | 98.8 | 129.0 | 58200 | | INTERP |
| YK4814*4214*K1-**HS | 229.8 | 107.8 | 129.0 | 60000 | | INTERP |
| YK4814*4214*K2-**HS | 229.8 | 107.8 | 132.0 | 60200 | | INTERP |
| YK4816*3916*K1-**GS | 253.4 | 111.0 | 132.0 | 61000 | | INTERP |
| YK4816*3916*K2-**GS | 253.4 | 103.0 | 132.0 | 61200 | | INTERP |
| YK4816*3916*K3-**GS | 253.4 | 103.0 | 135.0 | 63200 | | INTERP |
| YK4816*4216*K1-**HS | 253.8 | 107.8 | 129.0 | 65000 | | INTERP |
| YK4816*4216*K2-**HS | 253.8 | 107.8 | 132.0 | 65200 | | INTERP |
| YK5216*4416*K2-**HS | 256.0 | 112.8 | 134.0 | 66500 | | INTERP |
| YK4816*4216*K3-**HS | 253.8 | 107.8 | 129.0 | 66600 | | INTERP |
| YK5214*4414*K1-**GS | 231.8 | 109.5 | 137.0 | 66600 | | INTERP |
| YK5214*4414*K2-**GS | 231.8 | 109.5 | 137.0 | 66700 | | INTERP |
| YK5216*4416*K3-**HS | 256.0 | 112.8 | 132.0 | 69000 | | INTERP |
| YK5216*4416*K1-**GS | 255.8 | 109.5 | 137.0 | 71000 | | INTERP |
| YK5216*4416*K2-**GS | 255.8 | 109.5 | 137.0 | 71200 | | INTERP |
| YK5218*4418*K3-**HS | 280.0 | 112.8 | 132.0 | 73000 | | INTERP |
| YK5216*4416*K3-**GS | 255.8 | 109.5 | 142.0 | 73200 | | INTERP |
| YK5218*4418*K4-**HS | 280.0 | 62.0 | 132.0 | 77000 | | INTERP |
| YK5616*4816*K3-**HS | 262.3 | 121.0 | 134.0 | 77600 | | INTERP |
| YK5216*4416*K4-**HS | 256.0 | 112.8 | 134.0 | 78000 | | INTERP |
| YK5616*4816*K4-**HS | 262.3 | 121.0 | 139.0 | 82000 | | INTERP |
| NOTES: | Table continues on the next page. Additional notes, information, and seismic parameters are shown at the end of the table. | | | | | |

ATTACHMENT 1: CERTIFIED COMPONENTS

SEISMIC COMPLIANCE REPORT

TABLE 1 (continued)

DOCUMENT NO.: 17033CR1.1

| MANUFACTURER: JOHNSON CONTROLS, INC. | | | | | | |
|--|---|-------|--------|------------------------|--|---------------------|
| PRODUCT FAMILY: YK CENTRIFUGAL CHILLERS | | | | | | |
| MODEL NUMBER | DIMENSIONS (in) | | | MAX. WT. (lb) | DESCRIPTION / NOTES | BASIS |
| | DEPTH | WIDTH | HEIGHT | | | |
| YK Centrifugal Chillers (continued) | | | | | | |
| YK5616*4816*K3-**GS - Flooded | 262.0 | 119.0 | 139.0 | 87000 | | INTERP |
| YK5616*4816*K4-**GS - Flooded | 262.0 | 119.0 | 143.0 | 87200 | | INTERP |
| YK5616*4816*K3-**GS | 262.0 | 119.0 | 142.0 | 88000 | | INTERP |
| YK5616*4816*K4-**GS | 262.0 | 119.0 | 143.0 | 88300 | | INTERP |
| YK5618*4818*K4-**GS | 286.0 | 123.0 | 148.0 | 93600 | | INTERP |
| YK5618*4818*K4-**GS - Flooded | 286.0 | 119.0 | 143.0 | 94500 | | INTERP |
| YK5618*4818*K4-**HS | 280.0 | 126.0 | 139.0 | 97000 | | INTERP |
| YK5618*5218*K4-**HS | 286.3 | 132.0 | 140.0 | 99000 | | INTERP |
| YK5618*5218*K4-**GS | 286.0 | 123.0 | 148.0 | 99700 | | INTERP |
| YK5618*5218*K4-**GS - Flooded | 286.0 | 123.0 | 148.0 | 100600 | | INTERP |
| YK5618*5218*K7-**HS | 286.3 | 126.0 | 144.0 | 101000 | | INTERP |
| YK6216*5216*K4-**GS - Flooded | 261.5 | 130.0 | 148.0 | 101700 | | INTERP |
| YK6216*5216*K4-**GS | 261.5 | 130.0 | 148.0 | 102100 | | INTERP |
| YK6018*5218*K7-**HS | 286.3 | 132.0 | 152.0 | 104000 | | INTERP |
| YK6218*5618*K7-**GS - Flooded | 286.0 | 135.0 | 157.0 | 105000 | | INTERP |
| YK6218*5618*K7-**GS | 286.0 | 135.0 | 152.0 | 106000 | | INTERP |
| YK6418*5218*K7-**HS | 288.0 | 136.0 | 158.0 | 106000 | | INTERP |
| YK6418*5618*K4-**HS | 288.0 | 140.0 | 156.0 | 107000 | | INTERP |
| YK5622*5222*K7-**HS | 332.4 | 135.5 | 159.3 | 108000 | | INTERP |
| YK5622852222K7-DLHS | 332.4 | 135.5 | 159.3 | 108000 | | UUT 2 |
| YK6216*5616*K4-**GS - Flooded | 262.0 | 135.0 | 148.0 | 109500 | | EXTRAP ¹ |
| YK6216*5616*K4-**GS | 262.0 | 135.0 | 148.0 | 110000 | | EXTRAP ¹ |
| YK6418*5618*K7-**HS | 288.0 | 140.0 | 158.0 | 110000 | | EXTRAP ¹ |
| YK6022*5222*K7-**HS | 334.3 | 132.0 | 152.0 | 110000 | | EXTRAP ¹ |
| YK5622*5222*K7-**GS | 334.0 | 123.0 | 144.0 | 110000 | | EXTRAP ¹ |
| YK5622*5222*K7-**GS - Flooded | 334.0 | 123.0 | 149.0 | 110000 | | EXTRAP ¹ |
| YK5622*5222*K7-**GS - Flooded | 334.0 | 123.0 | 149.0 | 110000 | | EXTRAP ¹ |
| MOUNTING: | Neoprene pad floor mounted. | | | SEISMIC LEVELS: | $S_{DS} = 1.85g$ for $z/h = 1$ $S_{DS} = 2.50g$ for $z/h = 0$ | |
| NOTES: | <p>Product Construction: Welded carbon steel vessels. NEMA 1 carbon steel electrical panels. Copper tubes.</p> <p>Options/Subcomponents: See Attachment 3 for model nomenclature. Available subcomponents are listed in Table 2. Tubes available in 3/4" or 1" diameter, 0.025"-0.035" thickness. Water boxes available in 150lb or 300lb, compact or marine.</p> <p>Notes:</p> <p>1. Evaporator and condenser tested on UUT 2 represent the least seismic capacity compared to the extrapolated and interpolated models per ICC-ES AC156 Section 4.5.1.</p> | | | | | |

ATTACHMENT 1: CERTIFIED SUBCOMPONENTS

SEISMIC COMPLIANCE REPORT

TABLE 2 - SUBCOMPONENTS

DOCUMENT NO.: 17033CR1.1

| MANUFACTURER: JOHNSON CONTROLS, INC. | | | | | | |
|---|--|-------|--------|------------------|---------------------|--------|
| PRODUCT FAMILY: YK CENTRIFUGAL CHILLERS | | | | | | |
| MODEL NUMBER | DIMENSIONS (in) | | | MAX. WT. (lb) | DESCRIPTION / NOTES | BASIS |
| | DEPTH | WIDTH | HEIGHT | | | |
| Johnson Controls, Inc. - York Chiller Compressor | | | | | | |
| Q3 | 29.3 | 26.5 | 25.5 | 1654 | | EXTRAP |
| Q4 | 29.3 | 27.0 | 25.5 | 1654 | | UUT 1 |
| Q5 | 30.3 | 28.0 | 25.5 | 1991 | | INTERP |
| Q6 | 30.3 | 29.0 | 25.5 | 1991 | | INTERP |
| Q7 | 30.3 | 30.2 | 26.0 | 1914 | | INTERP |
| P7 | 31.1 | 32.2 | 30.0 | 2291 | | INTERP |
| P8 | 28.6 | 33.6 | 29.0 | 2509 | | INTERP |
| P9 | 28.6 | 35.3 | 29.5 | 2633 | | INTERP |
| H9 | 30.7 | 38.1 | 30.0 | 2793 | | INTERP |
| K1 | 31.3 | 45.7 | 41.0 | 4058 | | INTERP |
| K2 | 31.3 | 48.3 | 41.0 | 4204 | | INTERP |
| K3 | 37.2 | 55.4 | 48.0 | 6079 | | INTERP |
| K4 | 37.2 | 58.6 | 47.0 | 6340 | | INTERP |
| K7 | 43.4 | 65.8 | 53.0 | 8105 | | UUT 2 |
| Johnson Controls, Inc. - Evaporator | | | | | | |
| 2112*H | 182.8 | 30.0 | 35.0 | 4920 | | UUT 1 |
| 2512*G | 182.8 | 31.0 | 37.5 | 5922 | | INTERP |
| 2512*H | 183.0 | 31.0 | 37.5 | 6350 | | INTERP |
| 2912*G | 190.5 | 35.0 | 42.0 | 8400 | | INTERP |
| 2912*H | 190.8 | 35.0 | 42.0 | 8470 | | INTERP |
| 2916*G | 238.5 | 35.0 | 42.0 | 10005 | | INTERP |
| 3312*G | 196.5 | 39.0 | 46.0 | 10475 | | INTERP |
| 3312*H | 196.5 | 39.0 | 46.0 | 10475 | | INTERP |
| 3314*H | 220.5 | 39.0 | 46.0 | 11300 | | INTERP |
| 3316*G | 244.5 | 39.0 | 46.0 | 12255 | | INTERP |
| 3912*H | 198.0 | 48.0 | 52.0 | 13450 | | INTERP |
| 3912*G | 197.3 | 48.0 | 52.0 | 14330 | | INTERP |
| 3914*H | 224.0 | 48.0 | 52.0 | 15550 | | INTERP |
| 3916*G | 245.3 | 48.0 | 52.0 | 16825 | | INTERP |
| 3916*H | 248.0 | 48.0 | 52.0 | 16840 | | INTERP |
| 4414*G | 224.0 | 50.5 | 57.0 | 19508 | | INTERP |
| 4214*G | 224.0 | 50.5 | 57.0 | 19870 | | INTERP |
| 4214*H | 228.0 | 50.5 | 56.0 | 19920 | | INTERP |
| 4414*H | 228.0 | 50.5 | 57.0 | 20600 | | INTERP |
| 4216*H | 252.0 | 50.5 | 56.0 | 23700 | | INTERP |
| 4416*H | 252.0 | 50.5 | 57.0 | 24500 | | INTERP |
| 4814*G | 229.4 | 57.0 | 64.0 | 24860 | | INTERP |
| 4814*H | 230.0 | 57.0 | 64.0 | 24900 | | INTERP |
| 4816*G | 253.4 | 57.0 | 64.0 | 26895 | | INTERP |
| 4816*H | 254.0 | 57.0 | 64.0 | 26930 | | INTERP |
| 5214*G | 231.8 | 59.0 | 67.0 | 28105 | | INTERP |
| 5216*G | 255.8 | 59.0 | 69.3 | 32125 | | INTERP |
| NOTES: | Table continues on the next page. Additional notes, information, and seismic parameters are shown at the end of the table. | | | | | |

ATTACHMENT 1: CERTIFIED SUBCOMPONENTS

SEISMIC COMPLIANCE REPORT

TABLE 2 - SUBCOMPONENTS (continued)

DOCUMENT NO.: 17033CR1.1

| MANUFACTURER: JOHNSON CONTROLS, INC. | | | | | | |
|--|--|-------|--------|------------------|---------------------|---------------------|
| PRODUCT FAMILY: YK CENTRIFUGAL CHILLERS | | | | | | |
| MODEL NUMBER | DIMENSIONS (in) | | | MAX. WT. (lb) | DESCRIPTION / NOTES | BASIS |
| | DEPTH | WIDTH | HEIGHT | | | |
| Johnson Controls, Inc. - Evaporator (continued) | | | | | | |
| 5216*H | 256.0 | 59.0 | 67.0 | 32400 | | INTERP |
| 5616*G - Flooded | 262.0 | 64.0 | 73.3 | 36035 | | INTERP |
| 5616*H | 286.0 | 64.0 | 73.3 | 36100 | | INTERP |
| 5218*H | 280.0 | 59.0 | 67.0 | 36900 | | INTERP |
| 5616*G | 262.0 | 64.0 | 73.3 | 38265 | | INTERP |
| 5618*G | 286.0 | 64.0 | 73.3 | 41085 | | INTERP |
| 5618*G - Flooded | 286.0 | 64.0 | 73.3 | 42275 | | INTERP |
| 5618*H | 310.0 | 64.0 | 73.3 | 42900 | | INTERP |
| 5622*G | 334.0 | 64.0 | 73.3 | 44445 | | INTERP |
| 5622*H | 334.0 | 64.0 | 73.3 | 44500 | | UUT 2 |
| 5622*G - Flooded | 334.0 | 64.0 | 73.3 | 45500 | | EXTRAP ¹ |
| 6216*G - Flooded | 261.5 | 71.0 | 81.3 | 45500 | | EXTRAP ¹ |
| 6216*G | 261.5 | 71.0 | 81.3 | 45500 | | EXTRAP ¹ |
| 6218*G - Flooded | 285.5 | 71.0 | 81.3 | 45500 | | EXTRAP ¹ |
| 6018*H | 285.0 | 69.0 | 79.0 | 45500 | | EXTRAP ¹ |
| 6218*G | 285.5 | 71.0 | 81.3 | 45500 | | EXTRAP ¹ |
| 6022*H | 334.0 | 69.0 | 79.0 | 45500 | | EXTRAP ¹ |
| 6418*H | 286.0 | 73.0 | 83.0 | 45500 | | EXTRAP ¹ |
| Johnson Controls, Inc. - Condenser | | | | | | |
| 2112*G | 182.8 | 30.0 | 41.5 | 5040 | | EXTRAP |
| 2112*H | 182.8 | 30.0 | 41.5 | 5500 | | UUT 1 |
| 2512*H | 183.0 | 31.0 | 46.0 | 7440 | | INTERP |
| 2512*G | 182.8 | 31.0 | 46.0 | 7530 | | INTERP |
| 2912*H | 191.0 | 35.0 | 50.0 | 9260 | | INTERP |
| 2516*G | 230.8 | 31.0 | 46.0 | 9320 | | INTERP |
| 2912*G | 190.5 | 35.0 | 50.0 | 9850 | | INTERP |
| 2912*H | 191.0 | 35.0 | 50.0 | 9900 | | INTERP |
| 2914*H | 215.0 | 40.0 | 57.0 | 10960 | | INTERP |
| 2916*G | 238.5 | 35.0 | 50.0 | 11890 | | INTERP |
| 3314*G | 220.5 | 40.0 | 57.0 | 14120 | | INTERP |
| 3314*H | 221.0 | 40.0 | 57.0 | 14200 | | INTERP |
| 3316*H | 245.0 | 40.0 | 57.0 | 15600 | | INTERP |
| 3914*G | 221.3 | 46.0 | 65.0 | 20080 | | INTERP |
| 3914*H | 222.0 | 46.0 | 65.0 | 20150 | | INTERP |
| 3916*G | 245.3 | 46.0 | 65.0 | 21570 | | INTERP |
| 3916*H | 246.0 | 46.0 | 65.0 | 21620 | | INTERP |
| 4214*H | 224.0 | 50.5 | 68.0 | 22500 | | INTERP |
| 4216*H | 248.0 | 50.5 | 68.0 | 24700 | | INTERP |
| 4414*G | 224.0 | 50.5 | 69.3 | 25580 | | INTERP |
| 4416*G | 248.0 | 50.5 | 69.3 | 27950 | | INTERP |
| 4416*H | 248.0 | 50.5 | 69.3 | 27950 | | INTERP |
| 4418*H | 272.0 | 50.5 | 69.3 | 30300 | | INTERP |
| NOTES: | Table continues on the next page. Additional notes, information, and seismic parameters are shown at the end of the table. | | | | | |

ATTACHMENT 1: CERTIFIED SUBCOMPONENTS

SEISMIC COMPLIANCE REPORT

TABLE 2 - SUBCOMPONENTS (continued)

DOCUMENT NO.: 17033CR1.1

| MANUFACTURER: JOHNSON CONTROLS, INC. | | | | | | |
|---|--|-------|--------|------------------|---------------------|---------------------|
| PRODUCT FAMILY: YK CENTRIFUGAL CHILLERS | | | | | | |
| MODEL NUMBER | DIMENSIONS (in) | | | MAX. WT. (lb) | DESCRIPTION / NOTES | BASIS |
| | DEPTH | WIDTH | HEIGHT | | | |
| Johnson Controls, Inc. - Condenser (continued) | | | | | | |
| 4816*G | 253.4 | 55.0 | 74.0 | 34050 | | INTERP |
| 4816*H | 254.0 | 55.0 | 74.0 | 34050 | | INTERP |
| 4818*H | 278.0 | 55.0 | 74.0 | 36450 | | INTERP |
| 4818*G | 277.4 | 55.0 | 74.0 | 36920 | | INTERP |
| 5216*G | 255.8 | 59.0 | 78.0 | 40500 | | INTERP |
| 5218*H | 280.0 | 59.0 | 78.0 | 43700 | | INTERP |
| 5218*G | 279.8 | 59.0 | 78.0 | 43880 | | INTERP |
| 5222*G | 327.8 | 59.0 | 78.0 | 47790 | | INTERP |
| 5222*H | 328.0 | 59.0 | 78.0 | 47800 | | UUT 2 |
| 5616*G | 262.0 | 64.0 | 81.3 | 48800 | | EXTRAP ¹ |
| 5618*G | 286.0 | 64.0 | 81.3 | 48800 | | EXTRAP ¹ |
| 5618*H | 286.0 | 64.0 | 81.3 | 48800 | | EXTRAP ¹ |
| WEG - Motor | | | | | | |
| EF | 34.0 | 24.0 | 23.0 | 890 | 404.5 frame, 154HP | EXTRAP |
| EG | 34.0 | 24.0 | 23.0 | 959 | 404.5 frame, 177HP | EXTRAP |
| EH | 39.0 | 31.0 | 26.0 | 1367 | 444.5 frame, 201HP | EXTRAP |
| EJ | 39.0 | 31.0 | 26.0 | 1610 | 444.5 frame, 237HP | EXTRAP |
| EK | 39.0 | 31.0 | 26.0 | 1653 | 444.5 frame, 270HP | EXTRAP |
| EL | 39.0 | 31.0 | 26.0 | 1764 | 444.5 frame, 302HP | UUT 1 |
| EM | 47.0 | 33.0 | 27.0 | 2227 | 447.9 frame, 327HP | INTERP |
| EN | 47.0 | 33.0 | 27.0 | 2293 | 447.9 frame, 351HP | INTERP |
| EP | 47.0 | 33.0 | 27.0 | 2293 | 447.9 frame, 385HP | INTERP |
| ER | 47.0 | 33.0 | 27.0 | 2380 | 447.9 frame, 424HP | INTERP |
| ES | 47.0 | 33.0 | 27.0 | 2425 | 447.9 frame, 468HP | INTERP |
| ET | 47.0 | 33.0 | 27.0 | 2469 | 447.9 frame, 503HP | INTERP |
| EU | 47.0 | 30.0 | 27.0 | 2492 | 447.9 frame, 554HP | INTERP |
| EV | 47.0 | 30.0 | 27.0 | 2535 | 447.9 frame, 608HP | INTERP |
| EW | 59.0 | 34.0 | 33.0 | 4631 | 5010 frame, 655HP | INTERP |
| EX | 59.0 | 34.0 | 33.0 | 4631 | 5010 frame, 690HP | INTERP |
| EY | 62.0 | 37.0 | 35.0 | 4741 | L5010 frame, 740HP | INTERP |
| EZ | 62.0 | 37.0 | 35.0 | 5072 | L5010 frame, 790HP | INTERP |
| EA | 63.0 | 37.0 | 51.0 | 5072 | L5010 frame, 845HP | INTERP |
| EB | 63.0 | 37.0 | 51.0 | 5733 | L5010 frame, 900HP | INTERP |
| FA | 63.0 | 37.0 | 51.0 | 5733 | L5010 frame, 1000HP | INTERP |
| FB | 65.0 | 44.0 | 62.0 | 7030 | L5809 frame, 1100HP | INTERP |
| FC | 65.0 | 44.0 | 62.0 | 7030 | L5809 frame, 1200HP | INTERP |
| FD | 65.0 | 44.0 | 62.0 | 7030 | L5809 frame, 1300HP | UUT 3 |
| TECO - Motor | | | | | | |
| CK | 54.0 | 77.0 | 43.0 | 4160 | 5009 frame, 270HP | EXTRAP |
| CL | 54.0 | 77.0 | 43.0 | 4160 | 5009 frame, 302HP | EXTRAP |
| CM | 54.0 | 77.0 | 43.0 | 4160 | 5009 frame, 327HP | EXTRAP |
| CN | 54.0 | 77.0 | 43.0 | 4160 | 5009 frame, 351HP | EXTRAP |
| NOTES: | Table continues on the next page. Additional notes, information, and seismic parameters are shown at the end of the table. | | | | | |

ATTACHMENT 1: CERTIFIED SUBCOMPONENTS

SEISMIC COMPLIANCE REPORT

TABLE 2 - SUBCOMPONENTS (continued)

DOCUMENT NO.: 17033CR1.1

| MANUFACTURER: JOHNSON CONTROLS, INC. | | | | | | |
|--|---|-------|--------|------------------------|--|---------|
| PRODUCT FAMILY: YK CENTRIFUGAL CHILLERS | | | | | | |
| MODEL NUMBER | DIMENSIONS (in) | | | MAX. WT. (lb) | DESCRIPTION / NOTES | BASIS |
| | DEPTH | WIDTH | HEIGHT | | | |
| TECO - Motor (continued) | | | | | | |
| CP | 54.0 | 77.0 | 43.0 | 4160 | 5009 frame, 385HP | EXTRAP |
| CR | 54.0 | 77.0 | 43.0 | 4160 | 5009 frame, 424HP | EXTRAP |
| CS | 54.0 | 77.0 | 43.0 | 4160 | 5009 frame, 468HP | EXTRAP |
| CT | 54.0 | 77.0 | 43.0 | 4160 | 5009 frame, 503HP | EXTRAP |
| CU | 58.0 | 83.0 | 62.0 | 6950 | 5808 frame, 554HP | EXTRAP |
| CV | 58.0 | 83.0 | 62.0 | 6950 | 5808 frame, 608HP | EXTRAP |
| CW | 58.0 | 83.0 | 62.0 | 6950 | 5808 frame, 655HP | EXTRAP |
| CX | 58.0 | 83.0 | 62.0 | 6950 | 5808 frame, 690HP | EXTRAP |
| CY | 58.0 | 83.0 | 62.0 | 6950 | 5808 frame, 740HP | EXTRAP |
| CZ | 58.0 | 83.0 | 62.0 | 6950 | 5808 frame, 790HP | UUT 4 |
| CA | 72.0 | 62.0 | 52.1 | 7420 | 4009 frame, 845HP | INTERP |
| CB | 72.0 | 62.0 | 52.1 | 7420 | 4009 frame, 900HP | INTERP |
| DA | 72.0 | 62.0 | 52.1 | 7420 | 4009 frame, 1000HP | INTERP |
| DB | 74.0 | 64.0 | 56.0 | 7714 | 4510 frame, 1100HP | INTERP |
| DC | 74.0 | 64.0 | 56.0 | 7714 | 4510 frame, 1200HP | INTERP |
| DD | 74.0 | 64.0 | 56.0 | 7714 | 4510 frame, 1300HP | INTERP |
| DE | 74.0 | 64.0 | 56.0 | 7714 | 4510 frame, 1400HP | INTERP |
| DF | 74.0 | 64.0 | 56.0 | 7714 | 4510 frame, 1500HP | INTERP |
| DH | 74.0 | 64.0 | 56.0 | 7714 | 4511 frame, 1750HP | INTERP |
| DJ | 83.0 | 66.0 | 66.0 | 10531 | 5011 frame, 2000HP | INTERP |
| DK | 83.0 | 66.0 | 66.0 | 10531 | 5011 frame, 2250HP | INTERP |
| DL | 83.0 | 66.0 | 66.0 | 10531 | 5011 frame, 2500HP | UUT 2 |
| Johnson Controls, Inc. - VSD | | | | | | |
| VSD351F | 47.3 | 36.0 | 17.3 | 944 | | UUT 1 |
| VSD503F | 54.0 | 41.0 | 19.1 | 1101 | | UUT 4 |
| TM790F | 59.0 | 51.0 | 26.4 | 1840 | | UUT 3 |
| TM1048F | 59.0 | 51.0 | 26.4 | 2060 | | UUT 2 |
| HYP1300 | 85.0 | 55.0 | 30.1 | 3426 | | UUT 5 |
| Johnson Controls, Inc. - Controller | | | | | | |
| Optiview | 30.0 | 27.0 | 6.0 | 100 | | UUT 1,2 |
| Johnson Controls, Inc. - Oil Sump | | | | | | |
| Q3Q4-1427 | 27.5 | 14.0 | 14.0 | 400 | | UUT 1 |
| Q5Q7-1427 | 27.8 | 14.0 | 14.0 | 410 | | INTERP |
| P7-1631 | 31.0 | 16.0 | 16.0 | 466 | | INTERP |
| P8P9-1631 | 31.1 | 16.0 | 16.0 | 468 | | INTERP |
| H9-1631 | 31.1 | 16.0 | 16.0 | 466 | | INTERP |
| K1K2-1631 | 31.4 | 16.0 | 16.0 | 516 | | INTERP |
| K3K4-1631 | 31.4 | 16.0 | 16.0 | 516 | | INTERP |
| K7-1636 | 36.5 | 16 | 16 | 580 | | UUT 2 |
| MOUNTING: | Mounted within unit. | | | SEISMIC LEVELS: | $S_{DS} = 1.85g$ for $z/h = 1$ $S_{DS} = 2.50g$ for $z/h = 0$ | |
| NOTES: | Construction/Options: Model number uniquely identifies manufacturer, materials, and configuration of subcomponents. 1. See Note 1 in Table 1. | | | | | |

ATTACHMENT 2: UNIT UNDER TEST SUMMARIES

SEISMIC COMPLIANCE REPORT

UUT 1 - SMALL CHILLER

DOCUMENT NO.: 17033CR1.1

| | | | | | | |
|--|--------------|---|------------------------------|------------------------------|------------------------------|----------|
| MANUFACTURER: | | JOHNSON CONTROLS, INC. | | | | |
| MODEL NUMBER: | | YK2112X2112SQ4-ELHS | | | | |
| UNIT FUNCTION: | | WATER COOLED CHILLER | | | | |
| SERIAL NUMBER: | | N/A | | | | |
| DIMENSIONS (in) | | | WEIGHT (lb) | RES. FREQ. (Hz) | | |
| DEPTH | WIDTH | HEIGHT | | F-B | S-S | V |
| 176.0 | 69.0 | 87.0 | 16,500 | 14.4 | 13.7 | 27.2 |
| BUILDING CODE | | TEST CRITERIA | | LAB REPORT NO. | | |
| 2016 CBC | | ICC-ES AC156 | | ERDC-CERL 17033TR1 | | |
| S_{DS} (g) | z/h | A_{FLX-H} (g) | A_{RIG-H} (g) | A_{FLX-V} (g) | A_{RIG-V} (g) | |
| 1.85 | 1 | 2.96 | 2.22 | 1.68 | 0.68 | |
| 2.50 | 0 | | | | | |
| 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: | | Floor mounted on (8) Mason neoprene pad assemblies with a total of (16) 1-1/2" Grade 8 bolts. Pad assembly consists of: (1) 14"x7"x3/4" Mason BBPM 70 duro neoprene pad, (1) 15"x8"x3/8" steel backing plate, (2) 4"ODx1-5/8"IDx1/4" steel washers, (2) 4"ODx2-1/8"IDx1/4" Mason HLW duck washer, (2) 2-1/2"ODx2-1/16"IDx1-3/8" Mason HLB-2 duck tube bushing, (2) 2"ODx1-9/16"IDx1-3/8" anchor bolt sleeves, (2) 1-1/2" Grade 8 bolts. | | | | |
| CONSTRUCTION: | | Welded carbon steel vessels. NEMA 1 carbon steel electrical panels. Copper tubes. | | | | |
| SUBCOMPONENTS: | | Johnson Controls - compressor (Q4), Johnson Controls - evaporator (2112*H), Johnson Controls - condenser (2112*H), WEG - motor (EL), Johnson Controls - VSD (VSD351F), Johnson Controls - controller (Optiview), Johnson Controls - oil sump (Q3Q4-1427) | | | | |



ATTACHMENT 2: UNIT UNDER TEST SUMMARIES

SEISMIC COMPLIANCE REPORT

UUT 2 - LARGE CHILLER

DOCUMENT NO.: 17033CR1.1

| | | | | | | |
|---|--------------|--|------------------------------|------------------------------|------------------------------|----------|
| MANUFACTURER: | | JOHNSON CONTROLS, INC. | | | | |
| MODEL NUMBER: | | YK5622852222K7-DLHS | | | | |
| UNIT FUNCTION: | | WATER COOLED CHILLER | | | | |
| SERIAL NUMBER: | | N/A | | | | |
| DIMENSIONS (in) | | | WEIGHT (lb) | RES. FREQ. (Hz) | | |
| DEPTH | WIDTH | HEIGHT | | F-B | S-S | V |
| 332.4 | 135.5 | 159.3 | 108,000 | 8.7 | 5.6 | 17.3 |
| BUILDING CODE | | TEST CRITERIA | | LAB REPORT NO. | | |
| 2016 CBC | | ICC-ES AC156 | | ERDC-CERL 17033TR1 | | |
| S_{DS} (g) | z/h | A_{FLX-H} (g) | A_{RIG-H} (g) | A_{FLX-V} (g) | A_{RIG-V} (g) | |
| 1.85 | 1 | 2.96 | 2.22 | 1.68 | 0.68 | |
| 2.50 | 0 | | | | | |
| 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: | | Floor mounted on (10) Mason neoprene pad assemblies with a total of (40) 1-1/2" Grade 8 bolts. Pad assembly consists of: (1) 14"x14"x3/4" Mason BBPM 70 duro neoprene pad, (1) 15"x15"x3/8" steel backing plate, (4) 4"ODx1-5/8"IDx1/4" steel washers, (4) 4"ODx2-1/8"IDx1/4" Mason HLW duck washer, (4) 2-1/2"ODx2-1/16"IDx1-3/8" Mason HLB-2 duck tube bushing, (4) 2"ODx1-9/16"IDx1-3/8" anchor bolt sleeves, (4) 1-1/2" Grade 8 bolts. | | | | |
| CONSTRUCTION: | | Welded carbon steel vessels. NEMA 1 carbon steel electrical panels. Copper tubes. | | | | |
| SUBCOMPONENTS: | | Johnson Controls - compressor (K7), Johnson Controls - evaporator (5622*H), Johnson Controls - condenser (5222*H), TECO - motor (DL), Johnson Controls - VSD (TM1048F), Johnson Controls - controller (Optiview), Johnson Controls - oil sump (K7-1636) | | | | |



ATTACHMENT 2: UNIT UNDER TEST SUMMARIES

SEISMIC COMPLIANCE REPORT

UUT 3 - K7/WEG/790 DRIVELINE

DOCUMENT NO.: 17033CR1.1

| | |
|-----------------------|-------------------------------|
| MANUFACTURER: | JOHNSON CONTROLS, INC. |
| MODEL NUMBER: | K7/WEG/790 DRIVELINE ASSEMBLY |
| UNIT FUNCTION: | WATER COOLED CHILLER |
| SERIAL NUMBER: | N/A |



| DIMENSIONS (in) | | | WEIGHT (lb) | RES. FREQ. (Hz) | | |
|-----------------|-------|--------|----------------|-----------------|------|------|
| DEPTH | WIDTH | HEIGHT | | F-B | S-S | V |
| 159.8 | 108.0 | 91.2 | 20,800 | 14.4 | 17.1 | 14.4 |

| BUILDING CODE | TEST CRITERIA | LAB REPORT NO. |
|---------------|---------------|--------------------|
| 2016 CBC | ICC-ES AC156 | ERDC-CERL 17033TR1 |

| S _{DS} (g) | z/h | A _{FLX-H} (g) | A _{RIG-H} (g) | A _{FLX-V} (g) | A _{RIG-V} (g) |
|---------------------|-----|------------------------|------------------------|------------------------|------------------------|
| 3.30 | 1 | 8.20 | 5.50 | 2.20 | 3.60 |

| |
|---|
| 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: | Rigid floor mounted using (20) 3/4" Grade 8 bolts. |
|------------------|--|

| | |
|----------------------|---|
| CONSTRUCTION: | Welded carbon steel. NEMA 1 carbon steel electrical panels. |
|----------------------|---|

| | |
|-----------------------|---|
| SUBCOMPONENTS: | WEG - motor (FD), Johnson Controls - VSD (TM790F) |
|-----------------------|---|

| | |
|-----------------------|--|
| TESTING NOTES: | The driveline assembly was tested to amplified levels to simulate installation on a chiller. The amplified levels were determined from UUT 1 and UUT 2 at the connection of the subcomponents to the evaporator and condenser shells. The weight includes the weight of the fabricated fixture welded to the component supports. |
|-----------------------|--|

ATTACHMENT 2: UNIT UNDER TEST SUMMARIES

SEISMIC COMPLIANCE REPORT

UUT 4 - H9/TECO/503 DRIVELINE

DOCUMENT NO.: 17033CR1.1

| | |
|-----------------------|--------------------------------|
| MANUFACTURER: | JOHNSON CONTROLS, INC. |
| MODEL NUMBER: | H9/TECO/503 DRIVELINE ASSEMBLY |
| UNIT FUNCTION: | WATER COOLED CHILLER |
| SERIAL NUMBER: | N/A |

| DIMENSIONS (in) | | | WEIGHT (lb) | RES. FREQ. (Hz) | | |
|-----------------|-------|--------|----------------|-----------------|------|------|
| DEPTH | WIDTH | HEIGHT | | F-B | S-S | V |
| 135.6 | 108.3 | 93.1 | 14,400 | 14.7 | 12.9 | 26.2 |

| BUILDING CODE | TEST CRITERIA | LAB REPORT NO. |
|---------------|---------------|--------------------|
| 2016 CBC | ICC-ES AC156 | ERDC-CERL 17033TR1 |

| S _{DS} (g) | z/h | A _{FLX-H} (g) | A _{RIG-H} (g) | A _{FLX-V} (g) | A _{RIG-V} (g) |
|---------------------|-----|------------------------|------------------------|------------------------|------------------------|
| 3.30 | 1 | 8.20 | 5.50 | 2.20 | 3.60 |

| |
|---|
| 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: | Rigid floor mounted using (20) 3/4" Grade 8 bolts. |
| CONSTRUCTION: | Welded carbon steel. NEMA 1 carbon steel electrical panels. |
| SUBCOMPONENTS: | TECO - motor (CZ), Johnson Controls - VSD (VSD503F) |
| TESTING NOTES: | The driveline assembly was tested to amplified levels to simulate installation on a chiller. The amplified levels were determined from UUT 1 and UUT 2 at the connection of the subcomponents to the evaporator and condenser shells. The weight includes the weight of the fabricated fixture welded to the component supports. |

ATTACHMENT 2: UNIT UNDER TEST SUMMARIES

SEISMIC COMPLIANCE REPORT

UUT 5 - YMC2 W/ HYP1300 VSD

DOCUMENT NO.: 17033CR1.1

| | | | | | | |
|---|--------------|--|------------------------------|------------------------------|------------------------------|----------|
| MANUFACTURER: | | JOHNSON CONTROLS, INC. | | | | |
| MODEL NUMBER: | | YMC2-M6331-143939-1278 | | | | |
| UNIT FUNCTION: | | WATER COOLED CHILLER | | | | |
| SERIAL NUMBER: | | N/A | | | | |
| DIMENSIONS (in) | | | WEIGHT | RES. FREQ. (Hz) | | |
| DEPTH | WIDTH | HEIGHT | (lb) | F-B | S-S | V |
| 194.0 | 75.0 | 108.0 | 44,200 | 1.7 | 1.9 | 3.3 |
| BUILDING CODE | | TEST CRITERIA | | LAB REPORT NO. | | |
| 2016 CBC | | ICC-ES AC156 | | PEER 15045-TR-001 | | |
| S_{DS} (g) | z/h | A_{FLX-H} (g) | A_{RIG-H} (g) | A_{FLX-V} (g) | A_{RIG-V} (g) | |
| 2.00 | 1 | 3.20 | 2.40 | 1.68 | 0.68 | |
| 2.50 | 0 | | | | | |
| 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: | | Floor mounted on (4) SLFADA600-2-113 Mason spring isolators with (2) 8" long 9/16" fillet welds connecting the unit to each isolator and (8) 1" Grade 8 bolts connecting each isolator to the table. | | | | |
| CONSTRUCTION: | | Welded carbon steel vessels. NEMA 1 carbon steel electrical panels. | | | | |
| SUBCOMPONENTS: | | Johnson Controls - VSD (HYP1300) | | | | |
| TESTING NOTES: | | This is UUT 4 in the referenced test report. This test unit is only being used to qualify the VSD. | | | | |



ATTACHMENT 3: MODEL NOMENCLATURE

SEISMIC COMPLIANCE REPORT

YK CENTRIFUGAL CHILLERS

DOCUMENT NO.: 17033CR1.1

| DIGIT: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | - | - | - | - | - | - | - | - | - | - |
|---------|--------------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|-------------|--|---|---|---|---|---|---|---|---|
| SAMPLE: | Y | K | 5 | 6 | 2 | 2 | 8 | 5 | 2 | 2 | 2 | 2 | K | 7 | - | D | L | H | S | - | - | - | - | - | - | - | - | - | - |
| DIGIT | DIGIT DESCRIPTION | | | | | | | | | | | | | | | | | | | CODES | DEFINITIONS | | | | | | | | |
| 1-2 | Unit Type | | | | | | | | | | | | | | | | | | | YK | York YK Centrifugal Chiller | | | | | | | | |
| 3-4 | Evaporator Nominal Diameter (inches) | | | | | | | | | | | | | | | | | | | 21 | 21-in nominal diameter | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | ... | See Table 2 for specific configurations available | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | 64 | 64-in nominal diameter | | | | | | | | |
| 5-6 | Evaporator Nominal Length (feet) | | | | | | | | | | | | | | | | | | | 12 | 12-ft nominal length | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | ... | See Table 2 for specific configurations available | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | 22 | 22-ft nominal length | | | | | | | | |
| 7 | Evaporator Tube Arrangement | | | | | | | | | | | | | | | | | | | A-Z | 0.75-in diameter tubes, quantity varies depending on capacity | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | 0-9 | 1.0-in diameter tubes, quantity varies depending on capacity | | | | | | | | |
| 8-9 | Condenser Nominal Diameter (inches) | | | | | | | | | | | | | | | | | | | 21 | 21-in nominal diameter | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | ... | See Table 2 for specific configurations available | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | 56 | 56-in nominal diameter | | | | | | | | |
| 10-11 | Condenser Nominal Length (feet) | | | | | | | | | | | | | | | | | | | 12 | 12-ft nominal length | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | ... | See Table 2 for specific configurations available | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | 22 | 22-ft nominal length | | | | | | | | |
| 12 | Condenser Tube Arrangement | | | | | | | | | | | | | | | | | | | A-Z | 0.75-in diameter tubes, quantity varies depending on capacity | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | 0-9 | 1.0-in diameter tubes, quantity varies depending on capacity | | | | | | | | |
| 13-14 | Compressor | | | | | | | | | | | | | | | | | | | Q3 | Q3 compressor (smallest) | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | ... | See Table 2 for specific models available | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | K7 | K7 compressor (largest) | | | | | | | | |
| 15-17 | Motor Code | | | | | | | | | | | | | | | | | | | EF | 154HP WEG motor (smallest WEG) | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | ... | See Table 2 for specific models available | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | FD | 1300HP WEG motor (largest WEG) | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | CK | 270HP TECO motor (smallest TECO) | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | DL | 2500HP TECO motor (largest TECO) | | | | | | | | |
| 18 | Modification Level | | | | | | | | | | | | | | | | | | | G - Flooded | Style G Flooded Shell Evaporator: The tubes are in a bath of refrigerant. The refrigerant is boiled off and collected through the vapor discharge and then redistributed into the bottom of the evaporator. | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | G | Style G Hybrid Falling Film Evaporator: A hybrid of flooded shell and falling film technologies. The tubes are in a shallow bath of refrigerant and the refrigerant is sprayed down from the top of the evaporator instead of redistributed through the bottom. | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | H | Style H Hybrid Falling Film Evaporator: The only differences between Style H and Style G Hybrid Falling Film Evaporator is that Style H adds a perforated plate under the hood and has fewer tube supports, so the tubes in Style H span a longer distance. | | | | | | | | |
| 19 | Special Designation | | | | | | | | | | | | | | | | | | | S | Upgraded seismic construction | | | | | | | | |