APPLICATION FOR HCAI SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0045

HCAI Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: Johnson Controls

Manufacturer's Technical Representative: Joshua Borden

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

Telephone: (717) 825-9190 Email: joshua.lee.borden@jci.com

Product Information

Product Name: Chillers

Product Type: Chillers - Water Cooled

Product Model Number: YK Centrifugal Liquid Chillers

General Description: Welded carbon steel evaporator and condenser vessels with compressor, motor, VSD, oil sump, and controller.

Mounting Description: Neoprene Vibration Isolated, Floor Mounted

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

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

Mailing Address: 2902 Newmark Dr., Champaign IL 61822-1076

Telephone: (217) 373-6763 Email: James.wilcoski@usace.army.mil

Company Name: ENVIRONMENTAL TESTING LABORATORIES, INC. (ETL)

Contact Person: Jeremy Lange

Mailing Address: 11034 Indian Trail, Dallas TX 75229-3513

Telephone: (972) 247-9657 Email: Jeremy@etldallas.com

Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = 3.33 (SDS = 1.85); 1.50 (SDS = 2.50)

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

a_p (Amplification factor) = 2.5

R_p (Response modification factor) = 2.5

Ω_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 04/06/2029

Date: 4/6/2023

Name: Mohammad Karim Title: Supervisor, Health Facilities

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

Condition of Approval (if applicable):

MANWILL ENGINEERING

Johnson Controls

ATTACHMENT 1: CERTIFIED COMPONENTS

SPECIAL SEISMIC CERTIFICATION

TABLE 1

DOCUMENT NO.: 17033CR1.2

MANUFACTURER: JOHNSON CONTROLS

PRODUCT FAMILY: YK CENTRIFUGAL LIQUID CHILLERS

MODEL NUMBER	DIMENSIONS (in)			MAX. WT. (lb)	DESCRIPTION / NOTES	BASIS
	DEPTH	WIDTH	HEIGHT			
YK Centrifugal Chillers - Mod H						
YK2*2*Q3-**HS	144.0	60.0	100.0	16,060	12ft long, Evap.=21in, Cond.=21in	EXTRAP
YKA*A*Q3-**HS	144.0	60.0	94.0	15,820	12ft long, Evap.=21in, Cond.=21in	EXTRAP
YK2*2*Q4-**HS	144.0	60.0	100.0	16,070	12ft long, Evap.=21in, Cond.=21in	EXTRAP
YKA*A*Q4-**HS	144.0	69.0	94.0	15,830	12ft long, Evap.=21in, Cond.=21in	EXTRAP
YK2X2SQ4-ELHS	144.0	69.0	95.0	16,500	12ft long, Evap.=21in, Cond.=21in	**UUT 1**
YKB*B*Q3-**HS	168.0	60.0	94.0	16,020	14ft long, Evap.=21in, Cond.=21in	INTERP
YKB*B*Q4-**HS	168.0	69.0	94.0	16,030	14ft long, Evap.=21in, Cond.=21in	INTERP
YK4*4*Q3-**HS	144.0	62.0	103.0	19,470	12ft long, Evap.=25in, Cond.=25in	INTERP
YKC*C*Q3-**HS	144.0	62.0	98.0	18,760	12ft long, Evap.=25in, Cond.=25in	INTERP
YK4*4*Q4-**HS	144.0	62.0	101.0	19,480	12ft long, Evap.=25in, Cond.=25in	INTERP
YKC*C*Q4-**HS	144.0	62.0	98.0	18,770	12ft long, Evap.=25in, Cond.=25in	INTERP
YK4*4*Q5-**HS	144.0	62.0	107.0	19,790	12ft long, Evap.=25in, Cond.=25in	INTERP
YKC*C*Q5-**HS	144.0	62.0	100.0	19,080	12ft long, Evap.=25in, Cond.=25in	INTERP
YK4*4*Q6-**HS	144.0	62.0	106.0	19,780	12ft long, Evap.=25in, Cond.=25in	INTERP
YKC*C*Q6-**HS	144.0	62.0	100.0	19,070	12ft long, Evap.=25in, Cond.=25in	INTERP
YK4*4*Q7-**HS	144.0	62.0	106.0	19,700	12ft long, Evap.=25in, Cond.=25in	INTERP
YKC*C*Q7-**HS	144.0	62.0	100.0	18,990	12ft long, Evap.=25in, Cond.=25in	INTERP
YKC*C*Q8-**HS	144.0	62.0	100.0	18,890	12ft long, Evap.=25in, Cond.=25in	INTERP
YKD*D*Q3-**HS	168.0	62.0	98.0	19,740	14ft long, Evap.=25in, Cond.=25in	INTERP
YKD*D*Q4-**HS	168.0	62.0	98.0	19,750	14ft long, Evap.=25in, Cond.=25in	INTERP
YKD*D*Q5-**HS	168.0	62.0	100.0	20,050	14ft long, Evap.=25in, Cond.=25in	INTERP
YKD*D*Q6-**HS	168.0	62.0	100.0	20,040	14ft long, Evap.=25in, Cond.=25in	INTERP
YKD*D*Q7-**HS	168.0	62.0	100.0	19,960	14ft long, Evap.=25in, Cond.=25in	INTERP
YKD*D*Q8-**HS	168.0	62.0	100.0	19,860	14ft long, Evap.=25in, Cond.=25in	INTERP
YKE*C*Q4-**HS	144.0	66.0	101.0	21,030	12ft long, Evap.=29in, Cond.=25in	INTERP
YK6*4*Q5-**HS	144.0	66.0	109.0	23,560	12ft long, Evap.=29in, Cond.=25in	INTERP
YK6*6*Q5-**HS	144.0	70.0	113.0	24,140	12ft long, Evap.=29in, Cond.=25in	INTERP
YKE*C*Q5-**HS	144.0	66.0	101.0	21,340	12ft long, Evap.=29in, Cond.=25in	INTERP
YK6*4*Q6-**HS	144.0	66.0	106.0	23,550	12ft long, Evap.=29in, Cond.=25in	INTERP
YK6*6*Q6-**HS	144.0	70.0	115.0	24,130	12ft long, Evap.=29in, Cond.=25in	INTERP
YKE*C*Q6-**HS	144.0	66.0	101.0	21,320	12ft long, Evap.=29in, Cond.=25in	INTERP
YK6*4*Q7-**HS	144.0	66.0	108.0	23,470	12ft long, Evap.=29in, Cond.=25in	INTERP
YK6*6*Q7-**HS	144.0	70.0	114.0	24,050	12ft long, Evap.=29in, Cond.=25in	INTERP
YKE*C*Q7-**HS	144.0	66.0	102.0	21,240	12ft long, Evap.=29in, Cond.=25in	INTERP
YKE*C*Q8-**HS	144.0	66.0	102.0	21,140	12ft long, Evap.=29in, Cond.=25in	INTERP
YKE*E*Q5-**HS	144.0	72.0	104.0	23,050	12ft long, Evap.=29in, Cond.=29in	INTERP
YKE*E*Q6-**HS	144.0	72.0	104.0	23,040	12ft long, Evap.=29in, Cond.=29in	INTERP
YKE*E*Q7-**HS	144.0	72.0	104.0	22,960	12ft long, Evap.=29in, Cond.=29in	INTERP
YKE*E*Q8-**HS	144.0	70.0	104.0	22,850	12ft long, Evap.=29in, Cond.=29in	INTERP
YKF*D*Q4-**HS	168.0	66.0	101.0	22,210	14ft long, Evap.=29in, Cond.=25in	INTERP
YKF*D*Q5-**HS	168.0	66.0	101.0	22,520	14ft long, Evap.=29in, Cond.=25in	INTERP
YKF*D*Q6-**HS	168.0	66.0	101.0	22,510	14ft long, Evap.=29in, Cond.=25in	INTERP

NOTES: Table continues on the next page. Additional notes, information, and seismic parameters are shown at the end of the table.

MANUFACTURER: JOHNSON CONTROLS

PRODUCT FAMILY: YK CENTRIFUGAL LIQUID CHILLERS

MODEL NUMBER	DIMENSIONS (in)			MAX. WT. (lb)	DESCRIPTION / NOTES	BASIS
	DEPTH	WIDTH	HEIGHT			
YK Centrifugal Chillers - Mod H (continued)						
YKF*D*Q7-**HS	168.0	66.0	102.0	22,430	14ft long, Evap.=29in, Cond.=25in	INTERP
YKF*D*Q8-**HS	168.0	66.0	102.0	22,320	14ft long, Evap.=29in, Cond.=25in	INTERP
YKF*F*Q5-**HS	168.0	72.0	104.0	24,260	14ft long, Evap.=29in, Cond.=29in	INTERP
YKF*F*Q6-**HS	168.0	72.0	104.0	24,250	14ft long, Evap.=29in, Cond.=29in	INTERP
YKF*F*Q7-**HS	168.0	72.0	104.0	24,160	14ft long, Evap.=29in, Cond.=29in	INTERP
YKF*F*Q8-**HS	168.0	70.0	104.0	24,060	14ft long, Evap.=29in, Cond.=29in	INTERP
YKG*E*P8-**HS	144.0	77.0	121.0	29,330	12ft long, Evap.=33in, Cond.=29in	INTERP
YKG*E*P9-**HS	144.0	77.0	121.0	29,460	12ft long, Evap.=33in, Cond.=29in	INTERP
YKG*E*Q5-**HS	144.0	77.0	104.0	28,750	12ft long, Evap.=33in, Cond.=29in	INTERP
YKG*E*Q6-**HS	144.0	77.0	104.0	28,740	12ft long, Evap.=33in, Cond.=29in	INTERP
YKG*E*Q7-**HS	144.0	77.0	104.0	28,660	12ft long, Evap.=33in, Cond.=29in	INTERP
YKG*E*Q8-**HS	144.0	77.0	104.0	28,560	12ft long, Evap.=33in, Cond.=29in	INTERP
YKH*F*H9-**HS	168.0	77.0	128.0	31,290	14ft long, Evap.=33in, Cond.=29in	INTERP
YKH*F*P8-**HS	168.0	77.0	121.0	31,000	14ft long, Evap.=33in, Cond.=29in	INTERP
YKH*F*P9-**HS	168.0	77.0	121.0	31,130	14ft long, Evap.=33in, Cond.=29in	INTERP
YKJ*J*Q5-**HS	192.0	77.0	104.0	28,990	16ft long, Evap.=33in, Cond.=29in	INTERP
YKJ*J*Q6-**HS	192.0	77.0	104.0	28,980	16ft long, Evap.=33in, Cond.=29in	INTERP
YKJ*J*Q7-**HS	192.0	77.0	104.0	28,900	16ft long, Evap.=33in, Cond.=29in	INTERP
YKJ*J*Q8-**HS	192.0	77.0	104.0	28,800	16ft long, Evap.=33in, Cond.=29in	INTERP
YKK*K*H9-**HS	168.0	88.0	130.0	40,900	14ft long, Evap.=39in, Cond.=33in	INTERP
YKK*K*K1-**HS	168.0	88.0	128.0	42,210	14ft long, Evap.=39in, Cond.=33in	INTERP
YKK*K*K2-**HS	168.0	88.0	128.0	42,230	14ft long, Evap.=39in, Cond.=33in	INTERP
YKK*K*P8-**HS	168.0	88.0	126.0	40,610	14ft long, Evap.=39in, Cond.=33in	INTERP
YKK*K*P9-**HS	168.0	88.0	126.0	40,740	14ft long, Evap.=39in, Cond.=33in	INTERP
YKL*L*H9-**HS	192.0	88.0	130.0	43,290	16ft long, Evap.=39in, Cond.=33in	INTERP
YKL*L*K1-**HS	192.0	88.0	128.0	44,600	16ft long, Evap.=39in, Cond.=33in	INTERP
YKL*L*K2-**HS	192.0	88.0	128.0	44,620	16ft long, Evap.=39in, Cond.=33in	INTERP
YKM*K*K1-**HS	168.0	91.0	128.0	49,660	14ft long, Evap.=42in, Cond.=33in	INTERP
YKM*K*K2-**HS	168.0	91.0	128.0	49,680	14ft long, Evap.=42in, Cond.=33in	INTERP
YKN*L*K1-**HS	192.0	91.0	128.0	52,220	16ft long, Evap.=42in, Cond.=33in	INTERP
YKN*L*K2-**HS	192.0	91.0	128.0	52,240	16ft long, Evap.=42in, Cond.=33in	INTERP
YKO*O*H9-**HS	168.0	99.0	134.0	55,770	14ft long, Evap.=44in, Cond.=39in	INTERP
YKO*O*K1-**HS	168.0	99.0	136.0	57,080	14ft long, Evap.=44in, Cond.=39in	INTERP
YKO*O*K2-**HS	168.0	99.0	136.0	57,100	14ft long, Evap.=44in, Cond.=39in	INTERP
YKP*P*H9-**HS	192.0	99.0	134.0	58,250	16ft long, Evap.=44in, Cond.=39in	INTERP
YKP*P*K1-**HS	192.0	99.0	136.0	59,570	16ft long, Evap.=44in, Cond.=39in	INTERP
YKP*P*K2-**HS	192.0	99.0	136.0	59,590	16ft long, Evap.=44in, Cond.=39in	INTERP
YKP*P*K3-**HS	192.0	99.0	138.0	61,600	16ft long, Evap.=44in, Cond.=39in	INTERP
YKP*P*K4-**HS	192.0	99.0	138.0	61,850	16ft long, Evap.=44in, Cond.=39in	INTERP
YKQ*Q*K1-**HS	168.0	107.0	140.0	61,170	14ft long, Evap.=48in, Cond.=42in	INTERP
YKQ*Q*K2-**HS	168.0	107.0	140.0	61,190	14ft long, Evap.=48in, Cond.=42in	INTERP
YKR*R*K1-**HS	192.0	107.0	140.0	68,560	16ft long, Evap.=48in, Cond.=42in	INTERP

NOTES: Table continues on the next page. Additional notes, information, and seismic parameters are shown at the end of the table.

TABLE 1 (continued)

MANUFACTURER: JOHNSON CONTROLS

PRODUCT FAMILY: YK CENTRIFUGAL LIQUID CHILLERS

MODEL NUMBER	DIMENSIONS (in)			MAX. WT. (lb)	DESCRIPTION / NOTES	BASIS
	DEPTH	WIDTH	HEIGHT			
YK Centrifugal Chillers - Mod H (continued)						
YKR*R*K2-**HS	192.0	107.0	140.0	68,580	16ft long, Evap.=48in, Cond.=42in	INTERP
YKR*R*K3-**HS	192.0	107.0	139.0	70,590	16ft long, Evap.=48in, Cond.=42in	INTERP
YKR*R*K4-**HS	192.0	108.0	141.0	70,840	16ft long, Evap.=48in, Cond.=42in	INTERP
YKS*S*K2-**HS	192.0	113.0	146.0	82,920	16ft long, Evap.=52in, Cond.=44in	INTERP
YKS*S*K3-**HS	192.0	113.0	145.0	84,930	16ft long, Evap.=52in, Cond.=44in	INTERP
YKS*S*K4-**HS	192.0	113.0	147.0	83,220	16ft long, Evap.=52in, Cond.=44in	INTERP
YKS*S*K7-**HS	192.0	113.0	147.0	84,930	16ft long, Evap.=52in, Cond.=44in	INTERP
YKT*T*K3-**HS	216.0	113.0	145.0	86,000	18ft long, Evap.=52in, Cond.=44in	INTERP
YKT*T*K4-**HS	216.0	113.0	147.0	86,260	18ft long, Evap.=52in, Cond.=44in	INTERP
YKT*T*K7-**HS	216.0	113.0	147.0	87,970	18ft long, Evap.=52in, Cond.=44in	INTERP
YKU*U*K3-**HS	192.0	123.0	145.0	89,160	16ft long, Evap.=56in, Cond.=48in	INTERP
YKU*U*K4-**HS	192.0	123.0	147.0	89,420	16ft long, Evap.=56in, Cond.=48in	INTERP
YKU*U*K7-**HS	192.0	123.0	147.0	91,130	16ft long, Evap.=56in, Cond.=48in	INTERP
YKV*V*K3-**HS	216.0	123.0	145.0	94,180	18ft long, Evap.=56in, Cond.=48in	INTERP
YKV*V*K4-**HS	216.0	123.0	147.0	94,440	18ft long, Evap.=56in, Cond.=48in	INTERP
YKV*V*K7-**HS	216.0	123.0	147.0	96,150	18ft long, Evap.=56in, Cond.=48in	INTERP
YKV*W*K4-**HS	216.0	128.0	148.0	101,380	18ft long, Evap.=56in, Cond.=52in	INTERP
YKV*W*K7-**HS	216.0	128.0	152.0	97,850	18ft long, Evap.=56in, Cond.=52in	INTERP
YKW*W*K7-**HS	216.0	132.0	152.0	107,600	18ft long, Evap.=60in, Cond.=52in	INTERP
YKW8W2K7-DLHS	264.0	135.5	159.3	108,000	22ft long, Evap.=56in, Cond.=52in	**UUT 2**
YKY*Z*K7-**HS	264.0	132.0	152.0	110,000	22ft long, Evap.=60in, Cond.=52in	EXTRAP
YKX*W*K7-**HS	216.0	136.0	152.0	110,000	18ft long, Evap.=64in, Cond.=52in	EXTRAP
YKX*Y*K4-**HS	216.0	141.0	154.0	110,000	18ft long, Evap.=64in, Cond.=56in	EXTRAP
YKX*Y*K7-**HS	216.0	141.0	156.0	110,000	18ft long, Evap.=64in, Cond.=56in	EXTRAP
MOUNTING: Neoprene Pad Vibration Isolated Floor Mounted				**SEISMIC LEVELS:**	S_{DS} = 1.85g for z/h = 1 S_{DS} = 2.50g for z/h = 0	I_P = 1.5

NOTES:

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

Options/Subcomponents: See Attachment 3 for model nomenclature. Available subcomponents are listed in Table 2. Evaporator/Condenser tubes: 3/4" or 1" diameter, 0.025"-0.035" thickness. Water boxes: 150psi or 300psi, compact or marine. Voltage: 460V 60Hz. Refrigerant: R-134a, R-513a, R-515B or R-1234ze.

Extrapolation: 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.

Length ("E" in engineering guide) is defined as the face-to-face of tubesheets and does not include water boxes or nozzles.

Width ("A" in engineering guide) is defined as the outside edge of the evaporator tubesheet to the outside edge of the condenser tubesheet.

Height ("B" in engineering guide) is defined as the bottom of the tubesheet to the highest point on the VSD (does not include feet, pads, or isolators).

Weight is defined as the total operating weight including listed subcomponents, water, refrigerant, and water boxes (maximum configuration listed for interpolated models).

MANUFACTURER: JOHNSON CONTROLS

PRODUCT FAMILY: YK CENTRIFUGAL LIQUID CHILLERS

MODEL NUMBER	DIMENSIONS (in)			MAX. WT. (lb)	DESCRIPTION / NOTES	BASIS
	DEPTH	WIDTH	HEIGHT			
Subcomponent: Compressor - Manufacturer: Johnson Controls - Material: Cast Iron						
Q3	35.7	46.8	34.4	1,944		EXTRAP
Q4	36.3	46.8	34.4	1,956		**UUT 1**
Q5	39.6	47.8	37.6	2,262		INTERP
Q6	40.6	47.8	37.6	2,251		INTERP
Q7	39.4	47.8	36.4	2,169		INTERP
Q8	39.4	47.8	36.4	2,068		INTERP
P8	48.8	46.5	40.8	2,844		INTERP
P9	50.2	46.6	41.7	2,967		INTERP
H9	52.6	47.4	44.0	3,128		INTERP
K1	55.9	50.4	44.4	4,442		INTERP
K2	58.6	50.4	44.4	4,462		INTERP
K3	65.4	57.1	49.8	6,475		INTERP
K4	69.1	57.1	51.4	6,731		INTERP
K7	78.0	62.2	60.7	8,441		**UUT 2**
Subcomponent: Mod H Evaporator - Manufacturer: Johnson Controls - Material: Carbon Steel						
2X	144.0	30.0	35.0	4,920	12ft long x 21in dia.	**UUT 1**
A*	144.0	30.0	35.0	4,909	12ft long x 21in dia.	INTERP
2*	144.0	30.0	35.0	5,125	12ft long x 21in dia.	INTERP
B*	168.0	30.0	35.0	5,267	14ft long x 21in dia.	INTERP
4*	144.0	31.0	37.5	6,773	12ft long x 25in dia.	INTERP
C*	144.0	31.0	37.5	6,855	12ft long x 25in dia.	INTERP
D*	168.0	31.0	37.5	7,427	14ft long x 25in dia.	INTERP
6*	144.0	35.0	42.0	9,452	12ft long x 29in dia.	INTERP
E*	144.0	35.0	42.0	9,494	12ft long x 29in dia.	INTERP
F*	168.0	35.0	42.0	10,279	14ft long x 29in dia.	INTERP
G*	144.0	39.4	46.0	12,337	12ft long x 33in dia.	INTERP
H*	168.0	39.4	46.0	13,051	14ft long x 33in dia.	INTERP
J*	192.0	39.4	46.0	13,764	16ft long x 33in dia.	INTERP
K*	168.0	48.0	52.0	19,326	14ft long x 39in dia.	INTERP
L*	192.0	48.0	52.0	20,594	16ft long x 39in dia.	INTERP
M*	168.0	50.8	57.0	24,544	14ft long x 42in dia.	INTERP
N*	192.0	50.8	57.0	25,991	16ft long x 42in dia.	INTERP
O*	168.0	50.8	57.0	25,532	14ft long x 44in dia.	INTERP
P*	192.0	50.8	57.0	27,243	16ft long x 44in dia.	INTERP
Q*	168.0	57.0	64.5	32,425	14ft long x 48in dia.	INTERP
R*	192.0	57.0	64.5	34,243	16ft long x 48in dia.	INTERP
S*	192.0	61.4	68.2	43,353	16ft long x 52in dia.	INTERP
W8	264.0	64.0	73.3	44,500	22ft long x 56in dia.	**UUT 2**
T*	216.0	61.4	68.2	45,500	18ft long x 52in dia.	EXTRAP
U*	192.0	65.9	68.7	45,500	16ft long x 56in dia.	EXTRAP
V*	216.0	65.9	68.7	45,500	18ft long x 56in dia.	EXTRAP
W*	216.0	70.6	72.7	45,500	18ft long x 60in dia.	EXTRAP

NOTES: Table continues on the next page. Additional notes, information, and seismic parameters are shown at the end of the table.

MANUFACTURER: JOHNSON CONTROLS

PRODUCT FAMILY: YK CENTRIFUGAL LIQUID CHILLERS

MODEL NUMBER	DIMENSIONS (in)			MAX. WT. (lb)	DESCRIPTION / NOTES	BASIS
	DEPTH	WIDTH	HEIGHT			
Subcomponent: Mod H Evaporator - Manufacturer: Johnson Controls - Material: Carbon Steel (continued)						
X*	216.0	74.5	77.1	45,500	18ft long x 64in dia.	EXTRAP
Y*	264.0	70.6	72.7	45,500	22ft long x 60in dia.	EXTRAP
Subcomponent: Mod H Condenser - Manufacturer: Johnson Controls - Material: Carbon Steel						
2*	144.0	30.0	41.5	5,500	12ft long x 21in dia.	INTERP
2S	144.0	30.0	41.5	5,500	12ft long x 21in dia.	**UUT 1**
A*	144.0	30.0	41.5	5,887	12ft long x 21in dia.	INTERP
B*	168.0	30.0	41.5	6,372	14ft long x 21in dia.	INTERP
4*	144.0	31.0	46.0	8,029	12ft long x 25in dia.	INTERP
C*	144.0	31.0	46.0	8,516	12ft long x 25in dia.	INTERP
D*	168.0	31.0	46.0	9,239	14ft long x 25in dia.	INTERP
6*	144.0	35.0	50.0	10,628	12ft long x 29in dia.	INTERP
E*	144.0	37.0	50.0	11,553	12ft long x 29in dia.	INTERP
F*	168.0	37.0	50.0	12,495	14ft long x 29in dia.	INTERP
J*	192.0	37.0	50.0	13,310	16ft long x 29in dia.	INTERP
K*	168.0	40.0	57.0	16,769	14ft long x 33in dia.	INTERP
L*	192.0	40.0	57.0	18,067	16ft long x 33in dia.	INTERP
O*	168.0	48.0	66.0	22,969	14ft long x 39in dia.	INTERP
P*	192.0	48.0	66.0	24,704	16ft long x 39in dia.	INTERP
Q*	168.0	50.8	69.5	27,682	14ft long x 42in dia.	INTERP
R*	192.0	50.8	69.5	29,533	16ft long x 42in dia.	INTERP
S*	192.0	51.1	75.6	33,773	16ft long x 44in dia.	INTERP
T*	216.0	51.1	75.6	35,881	18ft long x 44in dia.	INTERP
U*	192.0	57.0	75.0	42,049	16ft long x 48in dia.	INTERP
V*	216.0	57.0	75.0	44,676	18ft long x 48in dia.	INTERP
W2	264.0	61.4	78.2	47,800	22ft long x 52in dia.	**UUT 2**
W*	216.0	61.4	78.2	48,800	18ft long x 52in dia.	EXTRAP
Y*	216.0	65.9	82.3	48,800	18ft long x 56in dia.	EXTRAP
Z*	264.0	61.4	78.2	48,800	22ft long x 52in dia.	EXTRAP
Subcomponent: Motor - Manufacturer: WEG						
EF	34.0	24.0	23.0	890	405.5 frame, 154HP	EXTRAP
EG	34.0	24.0	23.0	959	405.5 frame, 177HP	EXTRAP
EH	39.0	31.0	26.0	1,367	444.5 frame, 201HP	EXTRAP
EJ	39.0	31.0	26.0	1,610	444.5 frame, 237HP	EXTRAP
EK	39.0	31.0	26.0	1,653	444.5 frame, 270HP	EXTRAP
EL	39.0	31.0	26.0	1,764	444.5 frame, 302HP	**UUT 1**
EM	47.0	33.0	27.0	2,227	447.9 frame, 327HP	INTERP
EN	47.0	33.0	27.0	2,293	447.9 frame, 351HP	INTERP
EP	47.0	33.0	27.0	2,293	447.9 frame, 385HP	INTERP
ER	47.0	33.0	27.0	2,380	447.9 frame, 424HP	INTERP
ES	47.0	33.0	27.0	2,425	447.9 frame, 468HP	INTERP
ET	47.0	33.0	27.0	2,469	447.9 frame, 503HP	INTERP
EU	47.0	33.0	27.0	2,492	447.9 frame, 554HP	INTERP

NOTES: Table continues on the next page. Additional notes, information, and seismic parameters are shown at the end of the table.

MANUFACTURER: JOHNSON CONTROLS

PRODUCT FAMILY: YK CENTRIFUGAL LIQUID CHILLERS

MODEL NUMBER	DIMENSIONS (in)			MAX. WT. (lb)	DESCRIPTION / NOTES	BASIS
	DEPTH	WIDTH	HEIGHT			
Subcomponent: Motor - Manufacturer: WEG (continued)						
EV	47.0	33.0	27.0	2,535	447.9 frame, 608HP	INTERP
EW	59.0	34.0	33.0	4,630	5010 frame, 655HP	INTERP
EX	59.0	34.0	33.0	4,630	5010 frame, 690HP	INTERP
EY	59.0	34.0	33.0	4,741	L5010 frame, 740HP	INTERP
EZ	59.0	34.0	33.0	5,072	L5010 frame, 790HP	INTERP
EA	59.0	34.0	33.0	5,072	L5010 frame, 845HP	INTERP
EB	59.0	34.0	33.0	5,733	L5010 frame, 900HP	INTERP
FA	59.0	34.0	33.0	5,733	L5010 frame, 1000HP	INTERP
FB	65.0	44.0	57.0	7,030	L5809 frame, 1100HP	INTERP
FC	65.0	44.0	57.0	7,030	L5809 frame, 1200HP	INTERP
FD	65.0	44.0	57.0	7,030	L5809 frame, 1300HP	**UUT 3**
Subcomponent: Motor - Manufacturer: TECO						
CK	54.0	78.0	43.0	3,700	5009 frame, 270HP	EXTRAP
CL	54.0	78.0	43.0	3,700	5009 frame, 302HP	EXTRAP
CM	51.0	77.0	43.0	4,160	5009 frame, 327HP	EXTRAP
CN	51.0	77.0	43.0	4,160	5009 frame, 351HP	EXTRAP
CP	51.0	77.0	43.0	4,160	5009 frame, 385HP	EXTRAP
CR	54.0	70.0	43.0	4,070	5009 frame, 424HP	EXTRAP
CS	54.0	70.0	43.0	4,070	5009 frame, 468HP	EXTRAP
CT	54.0	70.0	43.0	4,070	5009 frame, 503HP	EXTRAP
CU	59.0	83.0	52.0	6,640	5808 frame, 554HP	EXTRAP
CV	59.0	83.0	52.0	6,640	5808 frame, 608HP	EXTRAP
CW	59.0	83.0	52.0	6,640	5808 frame, 655HP	EXTRAP
CX	59.0	75.0	52.0	6,860	5808 frame, 690HP	EXTRAP
CY	59.0	75.0	52.0	6,860	5808 frame, 740HP	EXTRAP
CZ	59.0	75.0	52.0	6,860	5808 frame, 790HP	**UUT 4**
CA	52.0	59.0	42.0	7,420	5010 frame, 845HP	INTERP
CB	56.0	69.0	55.0	7,420	5808 frame,900HP	INTERP
DA	64.0	69.0	55.0	7,420	5810 frame, 1000HP	INTERP
DB	64.0	69.0	55.0	7,714	5810 frame, 1100HP	INTERP
DC	64.0	69.0	55.0	7,714	5810 frame, 1200HP	INTERP
DD	67.0	59.0	56.0	7,714	4510 frame, 1300HP	INTERP
DE	67.0	59.0	56.0	7,714	4510 frame, 1400HP	INTERP
DF	67.0	59.0	56.0	7,714	4510 frame, 1500HP	INTERP
DH	67.0	59.0	56.0	7,714	4510 frame, 1750HP	INTERP
DJ	76.0	66.0	66.0	10,531	5011 frame, 2000HP	INTERP
DK	76.0	66.0	66.0	10,531	5011 frame, 22500P	INTERP
DL	76.0	66.0	66.0	10,531	5011 frame, 2500HP	**UUT 2**
Subcomponent: Controller - Manufacturer: Johnson Controls - Material: Carbon Steel (Enclosure)						
Optiview	30.0	27.0	6.0	100		**UUT 1,2**

NOTES: Table continues on the next page. Additional notes, information, and seismic parameters are shown at the end of the table.

MANUFACTURER: JOHNSON CONTROLS

PRODUCT FAMILY: YK CENTRIFUGAL LIQUID CHILLERS

MODEL NUMBER	DIMENSIONS (in)			MAX. WT. (lb)	DESCRIPTION / NOTES	BASIS
	DEPTH	WIDTH	HEIGHT			
Subcomponent: Oil Sump - Manufacturer: Johnson Controls - Material: Carbon Steel						
K2-1631	41.8	21.8	16.8	245		EXTRAP
P8P9-1631	41.4	22.1	22.3	250		EXTRAP
K3K4-1631	41.8	21.8	16.4	251		EXTRAP
H9-1631	41.5	21.8	31.4	253		EXTRAP
K7-1636	46.9	21.8	16.4	263		**UUT 2**
K1-1631	42.1	21.8	16.8	266		INTERP
Q5Q6-1427	39.1	20.8	26.8	267		INTERP
Q7Q8-1427	39.1	20.8	25.6	267		INTERP
Q3Q4-1427	39.1	20.8	22.1	300		**UUT 1**
Subcomponent: Vyper VSD - Manufacturer: Johnson Controls - Material: Carbon Steel (Enclosure)						
LVD0351FXN01K30B04LZ-46A	17.0	47.0	28.0	825		EXTRAP
VSD351KFT-46	17.0	47.0	36.0	944		**UUT 1**
LVD0503GXN01K30B06LZ-46A	19.0	54.0	28.5	950		INTERP
VSD503KFT-46	19.0	54.0	41.0	1,101		**UUT 4**
VSD790K-46	26.0	59.0	52.0	1,540		INTERP
VSD790KFT-46	26.0	59.0	52.0	1,900		INTERP
VSD1055K-46	26.0	64.0	56.0	1,557		INTERP
VSD1055KFT-46	26.0	64.0	56.0	2,104		**UUT 6**
VSD1300K-46	36.0	75.0	59.0	1,975		INTERP
VSD1300KFT-46	36.0	75.0	59.0	2,522		**UUT 7**
Subcomponent: TM VSD - Manufacturer: Johnson Controls - Material: Carbon Steel (Enclosure)						
TM790F	59.0	51.0	26.4	1,840	Obsolete model	**UUT 3**
TM1048F	59.0	51.0	26.4	2,060	Obsolete model	**UUT 2**

MOUNTING: Mounted within unit.

SEISMIC LEVELS: S_{DS} = 1.85g for z/h = 1; S_{DS} = 2.50g for z/h = 0; I_P = 1.5

NOTES: Construction/Options: Model number uniquely identifies manufacturer, materials, and configuration of subcomponents.
-Weight listed for Evaporator and Condenser is total operating weight, including water, refrigerant, and water boxes.

UUT 1

MANUFACTURER:	JOHNSON CONTROLS
MODEL NUMBER:	YK2X2SQ4-ELHS
UNIT FUNCTION:	WATER COOLED CHILLER
SERIAL NUMBER:	N/A

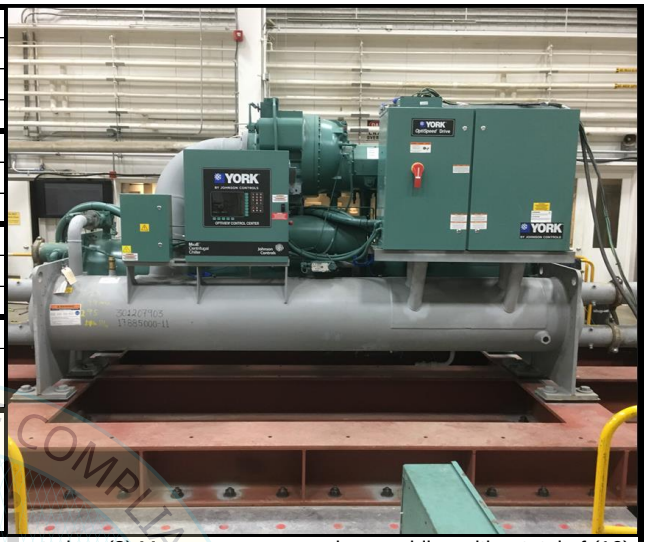
DIMENSIONS (in)			WEIGHT	RES. FREQ. (Hz)		
DEPTH	WIDTH	HEIGHT	(lb)	F-B	S-S	V
144.0	69.0	95.0	16,500	13.7	14.4	33.2

CODE & CRITERIA:	2022 CBC, ICC-ES AC156
TEST LABORATORY:	ERDC-CERL
REPORT:	17033TR1.2 (dated 4/4/2023), tested on 2/21/2018.

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
2.5	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:	Neoprene pad isolated floor mounted. UUT was 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 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 - Mod H Evaporator (2X), Johnson Controls - Mod H Condenser (2S), WEG - Motor (EL), Johnson Controls - Controller (Optiview), Johnson Controls - Oil Sump (Q3Q4-1427), Johnson Controls - Vyper VSD (VSD351KFT-46).
TESTING NOTES:	N/A

MANUFACTURER:	JOHNSON CONTROLS
MODEL NUMBER:	YKW8W2K7-DLHS
UNIT FUNCTION:	WATER COOLED CHILLER
SERIAL NUMBER:	N/A

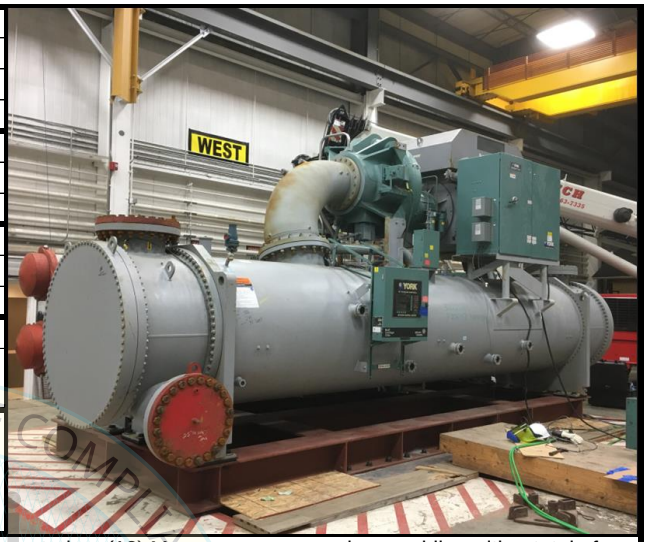
DIMENSIONS (in)			WEIGHT	RES. FREQ. (Hz)		
DEPTH	WIDTH	HEIGHT	(lb)	F-B	S-S	V
264.0	135.5	159.3	108,000	5.6	8.8	17.3

CODE & CRITERIA:	2022 CBC, ICC-ES AC156
TEST LABORATORY:	ERDC-CERL
REPORT:	17033TR1.2 (dated 4/4/2023), tested on 2/23/2018.

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
2.5	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:	Neoprene pad isolated floor mounted. UUT was 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 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 - Mod H Evaporator (W8), Johnson Controls - Mod H Condenser (W2), TECO - Motor (DL), Johnson Controls - Controller (Optiview), Johnson Controls - Oil Sump (K7-1636), Johnson Controls - TM VSD (TM1048F).
TESTING NOTES:	N/A

UUT 3

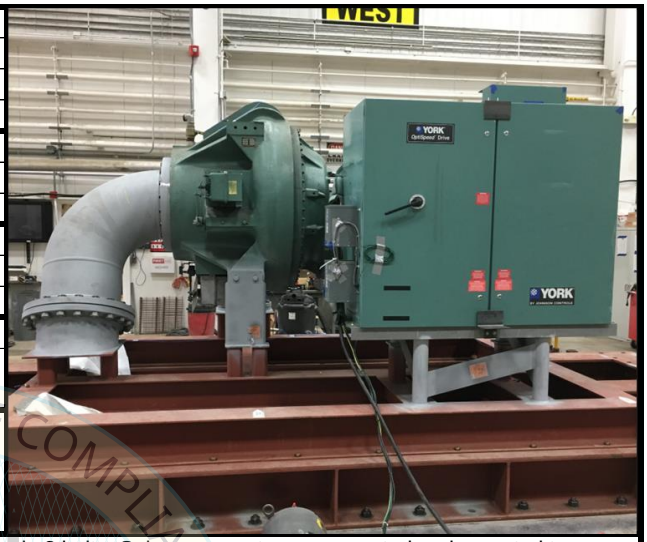
MANUFACTURER:	JOHNSON CONTROLS
MODEL NUMBER:	K7/WEG/790 DRIVELINE ASSEMBLY
UNIT FUNCTION:	WATER COOLED CHILLER
SERIAL NUMBER:	N/A

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

CODE & CRITERIA:	2022 CBC, ICC-ES AC156
TEST LABORATORY:	ERDC-CERL
REPORT:	17033TR1.2 (dated 4/4/2023), tested on 3/2/2018.

S_{DS} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
1.85	**1**	SEE NOTES	SEE NOTES	SEE NOTES	SEE NOTES
2.5	**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:	Assembly is rigid floor mounted using (20) 3/4" Grade 8 bolts. Subcomponents are supported and mounted to represent mounting on a full chiller.
CONSTRUCTION:	Welded carbon steel. NEMA 1 carbon steel electrical panel.
SUBCOMPONENTS:	WEG - Motor (FD), Johnson Controls - TM VSD (TM790F).
TESTING NOTES:	The subassembly was tested to an amplified RRS based on data from UUT 1 and UUT 2. The equivalent target level was S_{DS}=1.85g for z/h=1 and S_{DS}=2.50g for z/h=0. See test report for tested level. The dimensions and weight listed include the fabricated fixture welded to the subcomponent supports.

UUT 4

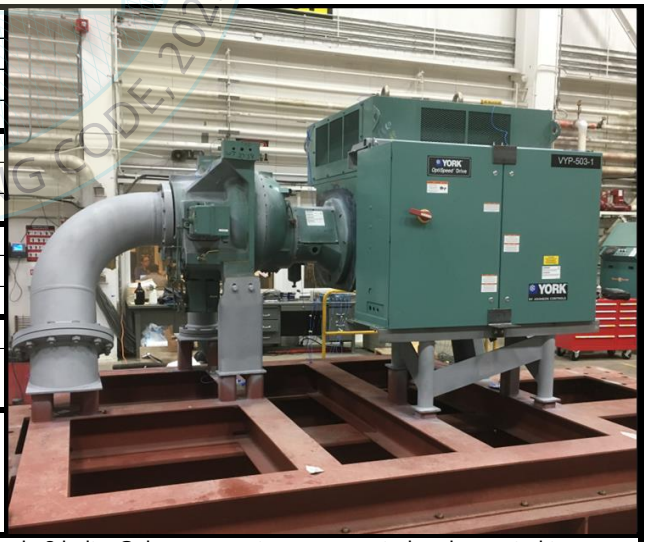
MANUFACTURER:	JOHNSON CONTROLS
MODEL NUMBER:	H9/TECO/503 DRIVELINE ASSEMBLY
UNIT FUNCTION:	WATER COOLED CHILLER
SERIAL NUMBER:	N/A

DIMENSIONS (in)			WEIGHT	RES. FREQ. (Hz)		
DEPTH	WIDTH	HEIGHT	(lb)	F-B	S-S	V
135.6	108.3	93.1	14,400	12.9	14.6	26.1

CODE & CRITERIA:	2022 CBC, ICC-ES AC156
TEST LABORATORY:	ERDC-CERL
REPORT:	17033TR1.2 (dated 4/4/2023), tested on 3/1/2018.

S_{DS} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
1.85	**1**	SEE NOTES	SEE NOTES	SEE NOTES	SEE NOTES
2.5	**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:	Assembly is rigid floor mounted using (20) 3/4" Grade 8 bolts. Subcomponents are supported and mounted to represent mounting on a full chiller.
CONSTRUCTION:	Welded carbon steel. NEMA 1 carbon steel electrical panel.
SUBCOMPONENTS:	TECO - Motor (CZ), Johnson Controls - Vyper VSD (VSD503KFT-46).
TESTING NOTES:	The subassembly was tested to an amplified RRS based on data from UUT 1 and UUT 2. The equivalent target level was S_{DS}=1.85g for z/h=1 and S_{DS}=2.50g for z/h=0. See test report for tested level. The dimensions and weight listed include the fabricated fixture welded to the subcomponent supports.

UUT 6

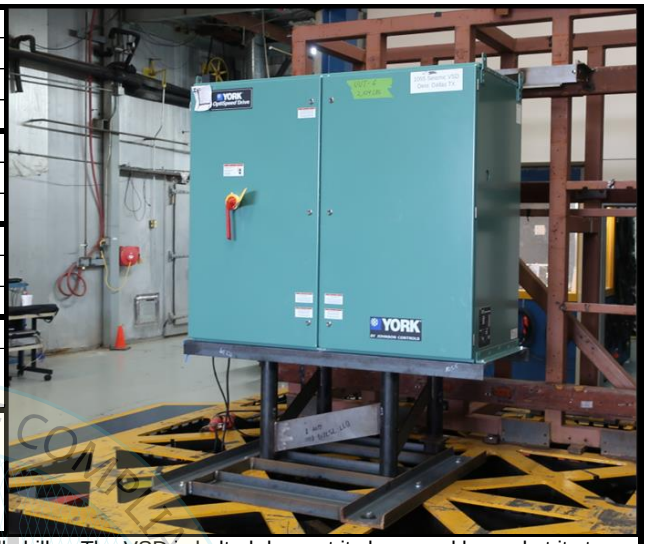
MANUFACTURER:	JOHNSON CONTROLS
MODEL NUMBER:	VSD1055KFT-46
UNIT FUNCTION:	WATER COOLED CHILLER
SERIAL NUMBER:	N/A

DIMENSIONS (in)			WEIGHT	RES. FREQ. (Hz)		
DEPTH	WIDTH	HEIGHT	(lb)	F-B	S-S	V
26.0	64.0	56.0	2,104	N/A	N/A	N/A

CODE & CRITERIA:	2022 CBC, ICC-ES AC156
TEST LABORATORY:	ERDC-CERL
REPORT:	17033TR2.0 (dated 4/4/2023), tested on 12/13/2022.

S_{DS} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
1.85	**1**	SEE NOTES	SEE NOTES	SEE NOTES	SEE NOTES
2.5	**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:	The VSD mounting represents installation on a full chiller. The VSD is bolted down at its base and braced at its top. The VSD is rigid floor mounted onto the VSD support assembly using (4) 7/16in Grade 5 bolts. The VSD support assembly (horizontal channels welded to vertical tubes) is fully welded at the bottom to the test fixture to mimic welding to the condenser shell. The fixture is rigid mounted to the table. The top brace is bolted to the top of the VSD with (2) 1/2in Grade 5 bolts. The top brace is bolted to the test fixture (representing the connection to the motor) using (2) 3/4in Grade 8 bolts. The fixture is rigid mounted to the table.
CONSTRUCTION:	Welded carbon steel. NEMA 1 carbon steel electrical panel.
SUBCOMPONENTS:	Johnson Controls - Vyper VSD (VSD1055KFT-46).
TESTING NOTES:	The subassembly was tested to an amplified RRS based on data from UUT 1 and UUT 2. The equivalent target level was S_{DS}=1.85g for z/h=1 and S_{DS}=2.50g for z/h=0. See test report for tested level. The dimensions and weight listed are for the VSD.

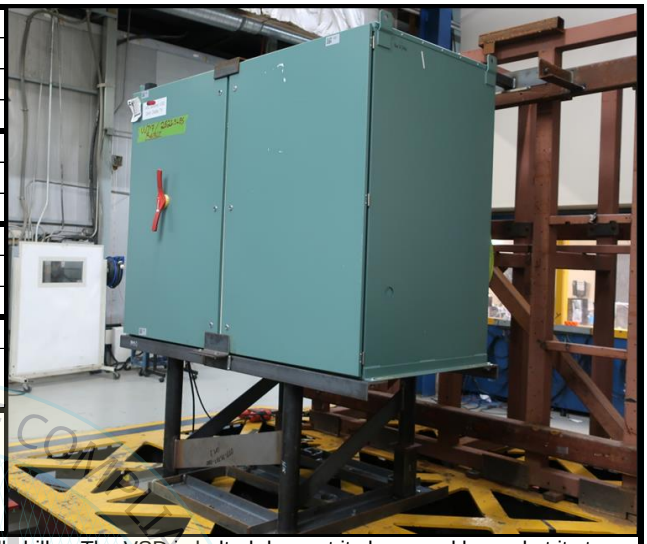
MANUFACTURER:	JOHNSON CONTROLS
MODEL NUMBER:	VSD1300KFT-46
UNIT FUNCTION:	WATER COOLED CHILLER
SERIAL NUMBER:	N/A

DIMENSIONS (in)			WEIGHT	RES. FREQ. (Hz)		
DEPTH	WIDTH	HEIGHT	(lb)	F-B	S-S	V
36.0	75.0	59.0	2,522	N/A	N/A	N/A

CODE & CRITERIA:	2022 CBC, ICC-ES AC156
TEST LABORATORY:	ERDC-CERL
REPORT:	17033TR2.0 (dated 4/4/2023), tested on 12/14/2022.

S_{DS} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
1.85	**1**	SEE	SEE	SEE	SEE
2.5	**0**	NOTES	NOTES	NOTES	NOTES

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:	The VSD mounting represents installation on a full chiller. The VSD is bolted down at its base and braced at its top. The VSD is rigid floor mounted onto the VSD support assembly using (4) 7/16in Grade 5 bolts. The VSD support assembly (horizontal channels welded to vertical tubes) is fully welded at the bottom to the test fixture to mimic welding to the condenser shell. The fixture is rigid mounted to the table. The top brace is bolted to the top of the VSD with (2) 1/2in Grade 5 bolts. The top brace is bolted to the test fixture (representing the connection to the motor) using (2) 3/4in Grade 8 bolts. The fixture is rigid mounted to the table.
CONSTRUCTION:	Welded carbon steel. NEMA 1 carbon steel electrical panel. Angle brackets were installed at the top and bottom of the doors to prevent opening.
SUBCOMPONENTS:	Johnson Controls - Vyper VSD (VSD1300KFT-46).
TESTING NOTES:	The subassembly was tested to an amplified RRS based on data from UUT 1 and UUT 2. The equivalent target level was S_{DS}=1.85g for z/h=1 and S_{DS}=2.50g for z/h=0. See test report for tested level. The dimensions and weight listed are for the VSD.

ATTACHMENT 3: MODEL NOMENCLATURE

SPECIAL SEISMIC CERTIFICATION

YK CENTRIFUGAL LIQUID CHILLERS

DOCUMENT NO.: 17033CR1.2

DIGIT:	1	2	3	4	5	6	7	8	9	10	11	12	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SAMPLE:	Y	K	6	B	4	S	Q	7	-	E	S	H	S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DIGIT	DIGIT DESCRIPTION	CODES	DEFINITIONS
1-2	Unit Type	YK	YORK YK Centrifugal Chiller
3	Evaporator Code	See def.	Possible codes: 2, 4, 6, A-H, J-Y
4	Evaporator Tube Bundle Code	Varies	Unique value for tube bundle to get desired capacity
5	Condenser Code	See def.	Possible codes: 2, 4, 6, A-F, J-L, O-W, Y-Z
6	Condenser Tube Bundle Code	Varies	Unique value for tube bundle to get desired capacity
7-8	Compressor Code	See def.	Possible codes: Q3, Q4, Q5, Q6, Q7, Q8, P8, P9, H9, K1, K2, K3, K4, K7
9	Voltage Frequency	-	60Hz
10-11	Motor Code	See def.	See Table 2 for possible codes
12	Design Level	H	Style H
13	Special Code	S	Special code for seismic construction