



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

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

OFFICE USE ONLY

APPLICATION #: **OSP – 0161 – 10**

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: Carrier Corporation

Manufacturer's Technical Representative: Anthony Molavi

Mailing Address: 9701 Old Statesville Road, Charlotte, NC 28269

Telephone: (704) 921-3976 Email: Anthony.Molavi@carrier.utc.com

Product Information

Product Name: Carrier 30 HXA and 30 HXC Chillers

Product Type: Water Cooled and Condenserless Chillers

Product Model Number: 30HX (See Attachments)

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

General Description: 30HXA (Condenserless) and 30HXC is a water-cooled screw chiller. Seismic enhancements made to the test units and modifications required to address the anomalies observed during the tests shall be incorporated into the production units.

Mounting Description: Floor mounted with 3/4" thick neoprene pads

Applicant Information

Applicant Company Name: Carrier Corporation

Contact Person: Anthony Molavi

Mailing Address: 9701 Old Statesville Road, Charlotte, NC 28269

Telephone: (704) 921-3976 Email: Anthony.Molavi@carrier.utc.com

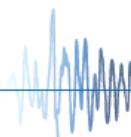
I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2016.

Signature of Applicant: Anthony Molavi Date: 11/9/2016

Title: Engineering Manager Company Name: Carrier Corporation

"Access to Safe, Quality Healthcare Environments that Meet California's Diverse and Dynamic Needs"

STATE OF CALIFORNIA – HEALTH AND HUMAN SERVICES AGENCY
OSH-FD-759 (REV 12/16/15)



OSHPD

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

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

Company Name: Buehler and Buehler Structural Engineers, Inc.
Name: Scott R. Hooker, S.E. California License Number: 3937 / Structural
Mailing Address: 600 Q Street, Sacramento, CA 95811
Telephone: (916) 443-0303 Email: shooker@bbse.com

Supports and Attachments Preapproval

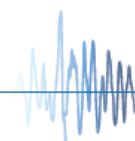
- ☐ Supports and attachments are preapproved under OPM-
(Separate application for OSHPD Preapproval of Manufacturer's Certification (OPM) of Supports and attachments is required)
☒ Supports and attachments are not preapproved

Certification Method

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

Testing Laboratory

Company Name: Wyle Laboratories
Contact Name: Don E. Smith
Mailing Address: 7800 Highway 20 West Huntsville, AL 35806
Telephone: (256) 716-4221 Email: Don.Smith@wyle.com





OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
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Seismic Parameters

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

Design Basis of Equipment or Components (F_p/W_p) = 4.5

S_{DS} (Design spectral response acceleration at short period, g) = 2.5

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) = 1.0

Equipment or Component Natural Frequencies (Hz) = _____

Overall dimensions and weight (or range thereof) = See attached tables

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): Operability Witness Letter

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

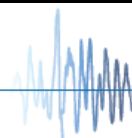
Signature: [Signature] Date: 2/6/17

Print Name: M. R. Karim Title: SHFR

Special Seismic Certification Valid Up to : S_{DS} (g) = 2.5 z/h = 1.0

Condition of Approval (if applicable): _____

"Access to Safe, Quality Healthcare Environments that Meet California's Diverse and Dynamic Needs"





Special Seismic Certification
OSHPD Preapproval Carrier AquaForce
30HXA and 30HXC Product Line



Table 1. 30HX Approved Unit List

Model Number	Nominal Capacity	Length (in)	Width (in)	Height (in)	Operating Weight		Interpolated / Tested
					HXA (lbs)	HXC (lbs)	
30HXA 076	75.0 tons	106	33	65	4,717	-	UUT-1
30HXC 076	75.0 tons	106	33	65	-	5,700	Interpolated
30HXA/HXC 086	85.0 tons	106	33	65	4,744	5,723	Interpolated
30HXA/HXC 096	95.0 tons	106	33	65	4,835	5,855	Interpolated
30HXA/HXC 106	105.0 tons	106	33	65	5,151	6,177	Interpolated
30HXA/HXC 116	115.0 tons	135	33	65	5,163	6,415	Interpolated
30HXA/HXC 126	125.0 tons	135	33	65	5,205	6,565	Interpolated
30HXA/HXC 136	135.0 tons	135	33	65	5,309	6,688	Interpolated
30HXA/HXC 146	145.0 tons	135	33	65	5,333	6,718	Interpolated
30HXA/HXC 161	155.0 tons	136	34	69	5,752	7,452	Interpolated
30HXA/HXC 171	165.0 tons	136	34	69	5,777	7,660	Interpolated
30HXA/HXC 186	175.0 tons	136	34	69	5,946	7,854	Interpolated
30HXA/HXC 206	211.0 tons	152	36	74	7,485	10,581	Interpolated
30HXA/HXC 246	246.0 tons	152	36	74	7,621	10,696	Interpolated
30HXA/HXC 261	255.0 tons	152	36	74	7,621	10,992	Interpolated
30HXA 271	265.0 tons	152	36	74	7,621	-	Interpolated
30HXC 271	265.0 tons	152	36	74	-	11,029	UUT-2

UUT-1 Test Summary

Testing Lab: Wyle Laboratories, 7800 Highway 20, West Huntsville, AL 35806
Testing Report: T58089.01 (March 21, 2011)

Model Number	Tonnage	Operating Weight (lbs)	Mounting	Excitation Direction	Frequency* (Hz)	Length (in)	Width (in)	Height (in)
30HXA076RA-661KA Seismic	75	4,717	Hard Mount - w/ Neoprene Pad	X	9.0	106	33	65
				Y	17.0			
				Z	**			

* Frequencies are for units prior to ICC ES AC-156 testing.

** No resonance below 33.3 Hz were detected

UUT Designation	UUT-1	Seismic Parameters							
Identification No.	30HXA076RA-661KA Seismic	Building Code	Test Criteria	S _{DS} (g)	z/h	Horizontal		Vertical	
Attachment Method	Floor mount w/ 3/4" thick neoprene pad					A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
	with four (4) - 5/8"Ø bolts per leg								
	(6 legs total)	CBC 2016	AC 156	2.50	1.0	4.0g	3.0g	1.68g	0.68g



Figure 1: UUT-1 on the shake table

Notes: The UUTs were full of contents during the test.

After the test, the UUT was functional and the structural integrity of the component attachment and force-resisting systems was maintained.

UUT-1 Summary Sub-Component List Tested

Sub-Component	Description	Part Number	Manufacturer	Material
Cooler	Shell and Tube HX	10RX400-401	Carrier	Carbon Steel Shell/Copper Tubes
Heat Exchanger (Oil Separator/Condenser)	Shell and Tube HX	09HX400-217	Carrier	Carbon Steel Shell/Copper Tubes
Compressor	Screw Compressor	06NA/06NW	Carrier	Carbon Steel
Compressor	Screw Compressor	06NA/06NW	A.O. Smith	Carbon Steel
Control Box	NEMA 1 Control Panel	C30HXA076RA-661AA	Gaston	Carbon Steel
Seismic Feet Package	Condenser Feet	09RX500097-01	Carrier	Carbon Steel
Neoprene Pad	Neoprene Waffle Pad	09RX500097-03	Mason	Neoprene

UUT-2 Test Summary

Testing Lab: Wyle Laboratories, 7800 Highway 20, West Huntsville, AL 35806
Testing Report: T58089.01 (March 21, 2011)

Model Number	Tonnage	Operating Weight (lbs)	Mounting	Excitation Direction	Frequency* (Hz)	Length (in)	Width (in)	Height (in)
30HXC271RZ-661AA Seismic	265	11,029	Hard Mount - w/ Neoprene Pad	X	6.0	152	36	74
				Y	13.0			
				Z	24.0			

* Frequencies are for units prior to ICC ES AC-156 testing.

** No resonance below 33.3 Hz were detected

UUT Designation	UUT-2	Seismic Parameters							
		Building Code	Test Criteria	S _{DS} (g)	z/h	Horizontal		Vertical	
						A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
Identification No.	30HXC271RZ-661AA Seismic	CBC 2016	AC 156	2.50	1.0	4.0g	3.0g	1.68g	0.68g
Attachment Method	Floor mount w/ 3/4" thick neoprene pad								
	with four (4) - 5/8"Ø bolts per leg (6 legs total)								



Figure 1: UUT-2 on the shake table

Notes: The UUTs were full of contents during the test.

After the test, the UUT was functional and the structural integrity of the component attachment and force-resisting systems was maintained.

UUT-2 Summary Sub-Component List Tested

Sub-Component	Description	Part Number	Manufacturer	Material
Cooler	Shell and Tube HX	10RX400-632	Carrier	Carbon Steel Shell/Copper Tubes
Heat Exchanger (Oil Separator/Condenser)	Shell and Tube HX	09HX400-264	Carrier	Carbon Steel Shell/Copper Tubes
Compressor	Screw Compressor	06NA/06NW	Carrier	Carbon Steel
Compressor	Screw Compressor	06NA/06NW	A.O. Smith	Carbon Steel
Economizer	Brazed Copper Plate	LL01SD010	Swep	Copper/Carbon Steel
Control Box	NEMA 1 Control Panel	C30HXC271RZ-661AA	Gaston	Carbon Steel
Seismic Feet Package	Condenser Feet	09RX500097-01	Carrier	Carbon Steel
Neoprene Pad	Neoprene Waffle Pad	09RX500097-03	Mason	Neoprene



Special Seismic Certification
OSHPD Preapproval Carrier AquaForce
30HXA and 30HXC Product Line



Table 2. Certified Sub-Component List

Cooler				
Part Number	Capacity	Manufacturer	Material	Interpolated / Tested
10HX400-401	17.0 gal	Carrier	Carbon Steel Shell/Copper Tubes	UUT-1
10HX400-402	19.0 gal	Carrier	Carbon Steel Shell/Copper Tubes	Interpolated
10HX400-408	22.6 gal	Carrier	Carbon Steel Shell/Copper Tubes	Interpolated
10HX400-406	21.4 gal	Carrier	Carbon Steel Shell/Copper Tubes	Interpolated
10HX400-405	24.0 gal	Carrier	Carbon Steel Shell/Copper Tubes	Interpolated
10RX400-601	28.5 gal	Carrier	Carbon Steel Shell/Copper Tubes	Interpolated
10RX400-611	28.5 gal	Carrier	Carbon Steel Shell/Copper Tubes	Interpolated
10RX400-621	33.4 gal	Carrier	Carbon Steel Shell/Copper Tubes	Interpolated
10RX400-631	43.1 gal	Carrier	Carbon Steel Shell/Copper Tubes	Interpolated
10RX400-632	47.2 gal	Carrier	Carbon Steel Shell/Copper Tubes	UUT-2

Heat Exchanger (Oil Separator/Condenser)				
Part Number	Capacity	Manufacturer	Material	Interpolated / Tested
09HX400-217	17.2 gal	Carrier	Carbon Steel Shell/Copper Tubes	UUT-1
09HX400-216	17.2 gal	Carrier	Carbon Steel Shell/Copper Tubes	Interpolated
09HX400-215	23.1 gal	Carrier	Carbon Steel Shell/Copper Tubes	Interpolated
09HX400-214	23.1 gal	Carrier	Carbon Steel Shell/Copper Tubes	Interpolated
09HX400-213	26.2 gal	Carrier	Carbon Steel Shell/Copper Tubes	Interpolated
09RX400-257	16.8 gal	Carrier	Carbon Steel Shell/Copper Tubes	Interpolated
09RX400-258	18.3 gal	Carrier	Carbon Steel Shell/Copper Tubes	Interpolated
09RX400-259	23.9 gal	Carrier	Carbon Steel Shell/Copper Tubes	Interpolated
09RX400-260	27.5 gal	Carrier	Carbon Steel Shell/Copper Tubes	Interpolated
09RX400-261	30.6 gal	Carrier	Carbon Steel Shell/Copper Tubes	Interpolated
09RX400-262	37.6 gal	Carrier	Carbon Steel Shell/Copper Tubes	Interpolated
09RX400-263	47.6 gal	Carrier	Carbon Steel Shell/Copper Tubes	Interpolated
09RX400-264	55.1 gal	Carrier	Carbon Steel Shell/Copper Tubes	UUT-2

Compressor					
Part Number	Capacity	Voltage	Manufacturer	Material	Interpolated / Tested
06NA/06NW	39.0 tons	460.0 V	Carrier	Carbon Steel	UUT-1
06NA/06NW	46.0 tons	460.0 V	Carrier	Carbon Steel	Interpolated
06NA/06NW	56.0 tons	460.0 V	Carrier	Carbon Steel	Interpolated
06NA/06NW	66.0 tons	460.0 V	Carrier	Carbon Steel	Interpolated
06NA/06NW	80.0 tons	460.0 V	Carrier	Carbon Steel	UUT-2

Compressor					
Part Number	Capacity	Voltage	Manufacturer	Material	Interpolated / Tested
06NA/06NW	39.0 tons	460.0 V	A.O. Smith	Carbon Steel	UUT-1
06NA/06NW	46.0 tons	460.0 V	A.O. Smith	Carbon Steel	Interpolated
06NA/06NW	56.0 tons	460.0 V	A.O. Smith	Carbon Steel	Interpolated
06NA/06NW	66.0 tons	460.0 V	A.O. Smith	Carbon Steel	Interpolated
06NA/06NW	80.0 tons	460.0 V	A.O. Smith	Carbon Steel	UUT-2

Economizer				
Part Number	Capacity	Manufacturer	Material	Interpolated / Tested
LL01SD010	0.87	SWEP	Brazed Copper Plate	UUT-2

Control Box Assembly			
Part Number	Manufacturer	Material	Interpolated / Tested
C30HXA076RA-661KA	Gaston	Carbon Steel Cabinet	UUT-1
C30HXC271RZ-661AA	Gaston	Carbon Steel Cabinet	UUT-2



Special Seismic Certification
OSHPD Preapproval Carrier AquaForce
30HXA and 30HXC Product Line



Model Number Nomenclature

30HXC 076 R - - 6 7 1

Model Description

30HXA —
Condenserless
Liquid Chiller

30HXC —
Water-Cooled
Liquid Chiller

Nominal Size

076	126	186
086	136	206
096	146	246
106	161	261
116	171	271

Refrigerant/Cooler Options

L — Nitrogen with Minus 1-Pass Cooler
M — R-134a with Minus 1-Pass Cooler
N — Nitrogen with Standard Cooler
P — R-134a with Plus 1-Pass Cooler
Q — Nitrogen with Plus 1-Pass Cooler
R — R-134a with Standard Cooler

Electrical Options

- — Across The Line Start
A — Non-Fused Disconnect
Y — Y-Delta Starter
Z — Y-Delta and Non-Fused Disconnect

Packaging Code

1 = Standard Domestic
2 = Standard Export

Series

Voltage Code

1 — 575-3-60
2 — 380-3-60
4 — 230-3-60
5 — 280/230-3-60
6 — 460-3-60
8 — 230-3-50
9 — 380/415-3-50

Control Options

- — Standard
E — Navigator Display with Energy Management
U — BACnet Communication Option
W — Energy Management Option and BACnet Communication Option