



**DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION
FACILITIES DEVELOPMENT DIVISION**

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

OFFICE USE ONLY

APPLICATION #: OSP-0161

HCAI 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: Chillers

Product Type: Chillers - Water Cooled

Product Model Number: 30HX (See Attachments)

General Description: 30HXA (Condenserless) and 30HXC water-cooled screw chillers.

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: Buehler Engineering, Inc

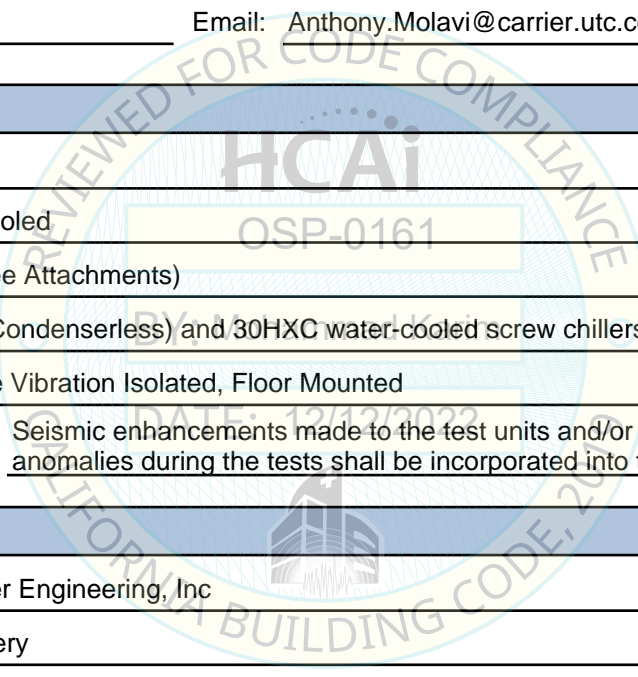
Contact Person: Gillian Montgomery

Mailing Address: 600 Q Street, Suite 200, Sacramento, CA 95811

Telephone: (916) 443-0303

Email: gmontgomery@buehlerengineering.com

Title: Senior Associate





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

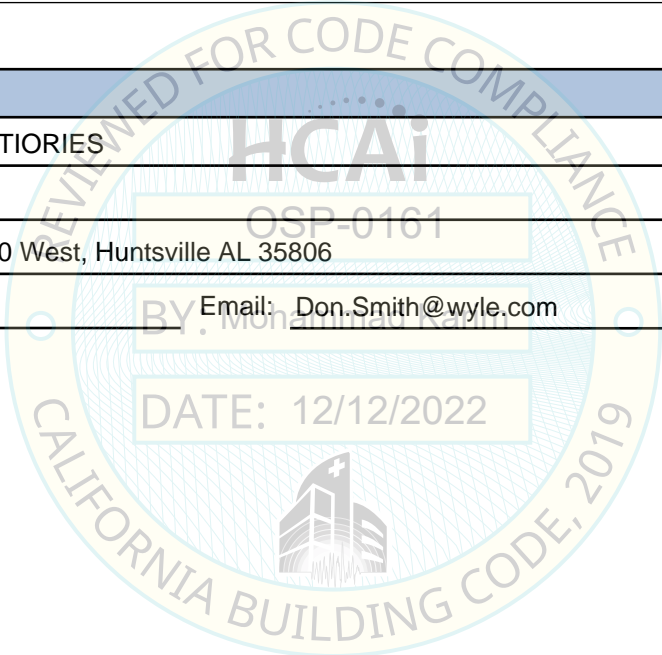
Company Name: BUEHLER ENGINEERING, INC.
Name: Scott Hooker California License Number: S3937
Mailing Address: 600 Q St., Suite 200, Sacramento, CA 95811
Telephone: (916) 443-0303 Email: shooker@buehlerengineering.com

Certification Method

GR-63-Core ICC-ES AC156 IEEE 344 IEEE 693 NEBS 3
 Other (Please Specify): _____

Testing Laboratory

Company Name: WYLE LABORATORIES
Contact Person: Don Smith
Mailing Address: 7800 Highway 20 West, Huntsville AL 35806
Telephone: (256) 837-4411 Email: Don.Smith@wyle.com





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Seismic Parameters

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

SDS (Design spectral response acceleration at short period, g) = 2.5

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

Natural frequencies (Hz) = See Attachment

Overall dimensions and weight = See Attachment

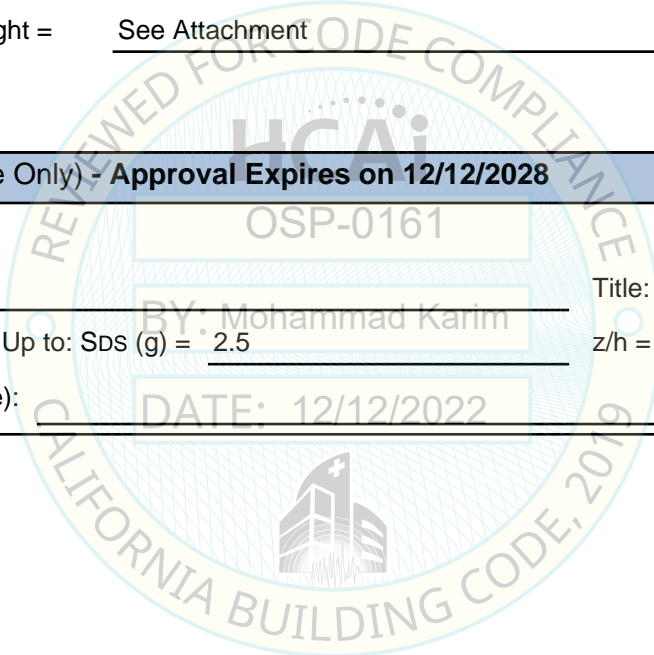
HCAI Approval (For Office Use Only) - Approval Expires on 12/12/2028

Date: 12/12/2022

Name: Mohammad Karim Title: Supervisor, Health Facilities

Special Seismic Certification Valid Up to: SDS (g) = 2.5 z/h = 1

Condition of Approval (if applicable): DATE: 12/12/2022





Special Seismic Certification
OSP-0161 Carrier AquaForce
30HXA and 30HXC Product Line

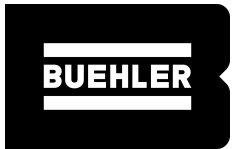
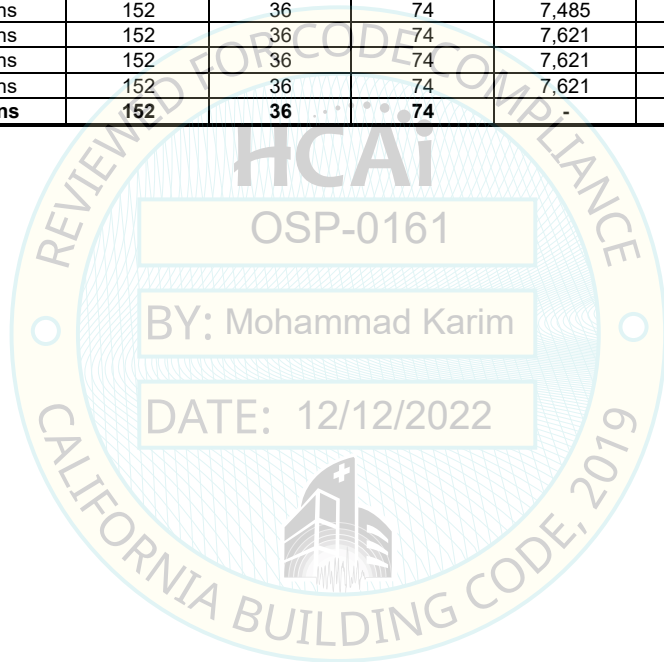


Table 1. 30HX Approved Unit List

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





Special Seismic Certification
OSP-0161 Carrier AquaForce
30HXA and 30HXC Product Line

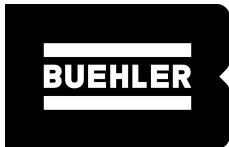


Table 2. Certified Sub-Component List

Cooler				
<i>Part Number</i>	<i>Capacity</i>	<i>Manufacturer</i>	<i>Material</i>	<i>Interpolated / Tested</i>
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)				
<i>Part Number</i>	<i>Capacity</i>	<i>Manufacturer</i>	<i>Material</i>	<i>Interpolated / Tested</i>
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

DATE: 12/12/2022

Compressor					
<i>Part Number</i>	<i>Capacity</i>	<i>Voltage</i>	<i>Manufacturer</i>	<i>Material</i>	<i>Interpolated / Tested</i>
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					
<i>Part Number</i>	<i>Capacity</i>	<i>Voltage</i>	<i>Manufacturer</i>	<i>Material</i>	<i>Interpolated / Tested</i>
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				
<i>Part Number</i>	<i>Capacity</i>	<i>Manufacturer</i>	<i>Material</i>	<i>Interpolated / Tested</i>
LL01SD010	0.87	SWEP	Brazed Copper Plate	UUT-2

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



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

Packaging Code

1 = Standard Domestic
 2 = Standard Export

Series

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

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

Electrical Options

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

Control Options

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

UUT-1 Test Summary

Testing Lab: Wyle Laboratories, 7800 Highway 20, West Hunstville, 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	Floor Mount - w/ Neoprene Pad	X	9.0	106	33	65
				Y	17.0			
				Z	>33.3			

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

UUT Designation Identification No. Attachment Method	UUT-1 30HXA076RA-661KA Seismic Floor mount w/ 3/4" thick neoprene pad with four (4) - 5/8"Ø A325 bolts per leg (6 legs total)	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}
		CBC 2022	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 Tub
Heat Exchanger (Oil Separator/Condenser)	Shell and Tube HX	09HX400-217	Carrier	Carbon Steel Shell/Copper Tub
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	Floor 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.

UUT Designation	UUT-2	Seismic Parameters							
		Building Code	Test Criteria	S _{ps} (g)	z/h	Horizontal		Vertical	
						A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
Identification No.	30HXC271RZ-661AA Seismic	CBC 2019 CBC 2022	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 A325 bolts per leg (6 legs total)								



Figure 2: 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 Tub
Heat Exchanger (Oil Separator/Condenser)	Shell and Tube HX	09HX400-264	Carrier	Carbon Steel Shell/Copper Tub
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