INVITATION FOR BID

ISSUING OFFICE:

GENERAL SERVICES AGENCY
GOVERNMENT OF GUAM
148 ROUTE 1, MARINE DRIVE
PITI, GUAM 96915

12/29/22
CLAUDIA S. ACFALLE
Chief Procurement Officer

DATE ISSUED: **12/30/2022** BID INVITATION NO: **GSA-011-23**

BID FOR: **Purchase and Installation of a 30-TON CHILLER**
SPECIFICATION: **SEE ATTACHED**

DESTINATION: **OFFICE OF CIVIL DEFENSE/GUAM HOMELAND SECURITY**
Site Visit Schedule: 9:00am, Friday, January 6, 2023 – Location: Office of Homeland Security 221-B Chalan Palasyo Street Agana Heights Guam 96910

REQUIRED DELIVERY DATE: **Completion of Installation 180 Days Upon Receipt of Purchase Order.**

INSTRUCTION TO BIDDERS:

INDICATE WHETHER: ____ INDIVIDUAL ____ PARTNERSHIP ✓ CORPORATION

INCORPORATED IN: _____

This bid shall be submitted in duplicate and sealed to the issuing office above no later than (Time) 10:00am, Date: 01/16/2023 and shall be publicly opened. Bid submitted after the time and date specified above shall be rejected. See attached General Terms and Conditions, and Sealed Bid Solicitation for details.

The undersigned offers and agrees to furnish within the time specified, the articles and services at the price stated opposite the respective items listed on the schedule provided, unless otherwise specified by the bidder. In consideration to the expense of the Government in opening, tabulating, and evaluating this and other bids, and other considerations, the undersigned agrees that this bid remain firm and irrevocable within 90 calendar days from the date opening to supply any or all the items which prices are quoted

NAME AND ADDRESS OF BIDDER:
CARRIER GUAM INC.
188 TUN JOAQUIN FLORES RD.
TAMUNING GU 96913

SIGNATURE AND TITLE OF PERSON AUTHORIZED TO SIGN THIS BID:

AWARD: CONTRACT NO.: GSA-011-23 AMOUNT $65,200.00 DATE: 4/17/2023

ITEM NO(S): 1.0 AWARDED: Purchase & Installation of a 30 Ton Chiller

CONTRACTING OFFICER:

4/17/2023
CLAUDIA S. ACFALLE
Chief Procurement Officer

NAME AND ADDRESS OF CONTRACTOR:
Carrier Guam Inc.
188 Tun Joaquin Flores Rd.
Tamuning, Guam 96913

SIGNATURE AND TITLE OF PERSON AUTHORIZED TO SIGN THIS CONTRACT:

MANAGER

ITEM NO	DESCRIPTION	QTY / UOM	UNIT PRICE	PRICE EXTENSION
1.0	**Purchase and Installation of a 30-Ton A/C Chiller Unit**	1 Job	$ 58,000.00	$ 58,000.00

GENERAL REQUIREMENTS: These specifications have been written to describe the minimum equipment and performance requirements to be supplied by the bidder responding to this Invitation for Bid (IFB). The Government of Guam may conduct reasonable test upon delivery and before acceptance.

The successful bidder shall furnish all information and instructions for the proper operation of the equipment supplied.

The government reserves the right to accept and/or reject any all bids, to waive any defects, irregularities, or specifications discrepancies and award the bid as council deems to in the best interest of the government.

SPECIFICATIONS	**BIDDING ON/REMARKS**
Purchase and Installation of one (1) 30-Ton A/C Chiller Unit	\
- Provide and install one (1) 30-Ton A/C Chiller Unit in place of the previous Chiller Unit.	\
- Fabricate and install the necessary chilled water piping to allow for new connection Between the new chiller and existing piping	\
Clean existing debris from previous chiller unit	\
- Insulate all chilled water piping affected by the installation of the new Chiller Unit	\
- Connect the existing electrical infrastructure to the new Chiller Unit	\
- Copper to copper coils	\
- Provide factory authorized startup of the new Chiller Unit and verify proper operation of all installed items.	\
• Provide the necessary lifting and rigging of equipment and materials. • Provide the necessary connections for the installation of new Chiller Unit	
Quarterly Preventative Maintenance Agreement	1,800.00 / Quarter
Manufacturers and workmanship warranty 1 year	INCLUDED IN THE BID
Start-up and commissioning of new 30-Ton A/C chiller unit	INCLUDED IN THE BID

Bidding On:
Manufacturer: Carrier
Make: Carrier
Year: 2023
Place of Origin: USA
Date of Delivery: Completion of Installation
180 Days Upon Receipt of Purchase Order

These specifications were prepared by Stephen Cahill, Administrative Assistant, and approved by Samantha J. Brennan, Homeland Security Advisor.

SUBMITTAL

Project

Guam Homeland Security - GSA

Date

Monday, January 30, 2023

Carrier Guam Inc
188 Tun Joaquin Flores Rd. Tamuning
Guam 96913

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Prepared By:

01/30/2023
06:59PM

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CHILLER

Tag Cover Sheet
Unit Report
Certified Drawing
Wiring Diagram
Performance Report
Guide Specification

Unit Report For CHILLER

Project: Guam Homeland Security - GSA
Prepared By:

01/30/2023
06:59PM

Unit Information

Tag Name:	**CHILLER**	
Model Number:	**30RAP030**	
Condenser Type:	**Air Cooled**	
Compressor Type:	**Scroll**	
Nameplate Voltage:	**208/230-3-60**	V-Ph-Hz
Quantity:	**1**	
Manufacturing Source:	**Charlotte, NC USA**	
Refrigerant:	**R410A**	
Independent Refrigerant Circuits:	**1**	
Capacity Control Steps:	**2**	
Minimum Capacity:	**50.0**	%
Shipping Weight:	**1527**	lb
Operating Weight:	**1548**	lb
Unit Length:	**89**	in
Unit Width:	**41**	in
Unit Height:	**79**	in

Accessories and Installed Options

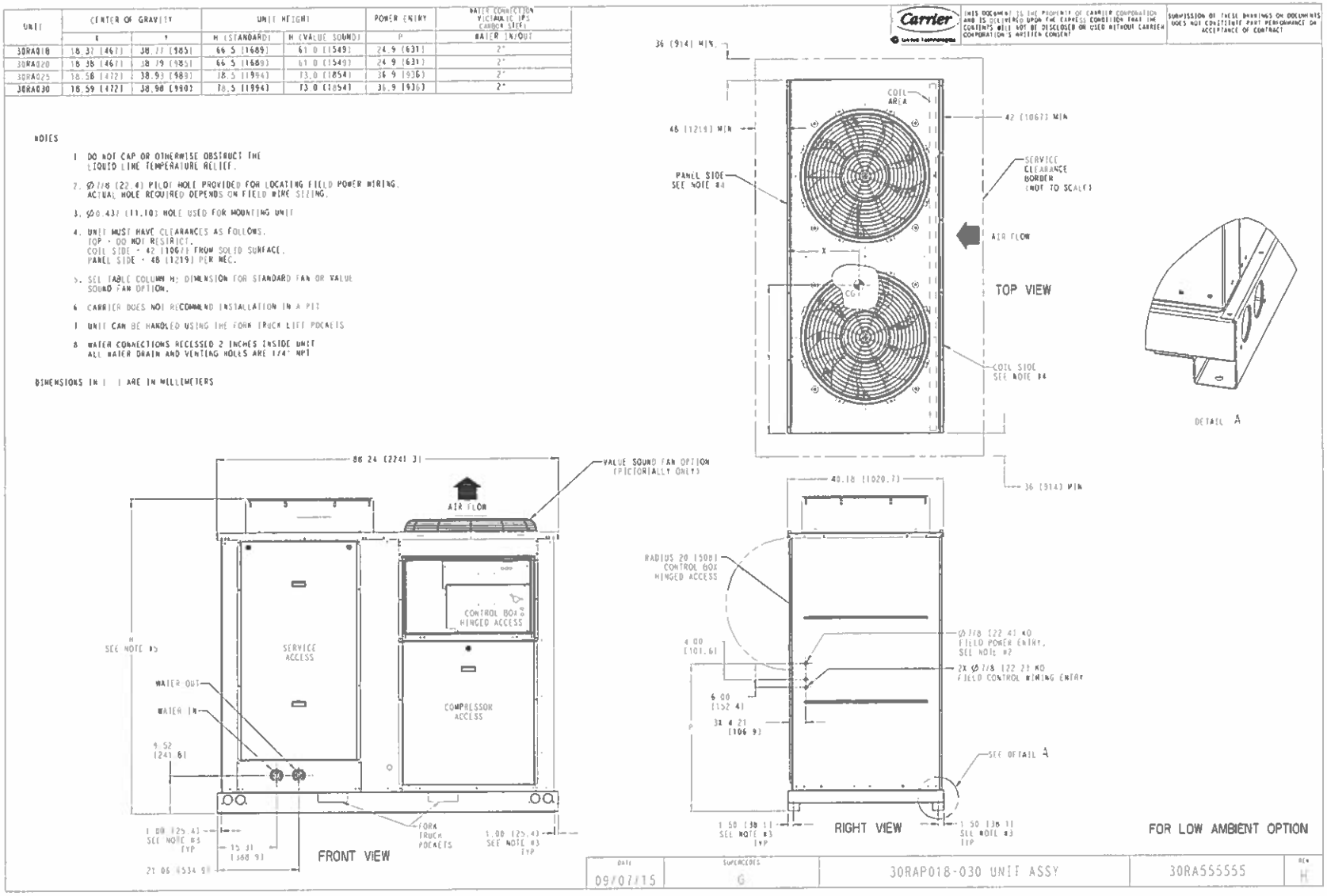
Evaporator Heater
Cu Fin/Cu Tube
Value Sound - Metal Fans
Single Point
Fixed Speed Condenser Fan

Chiller Warranty Information (Note: for US & Canada only)

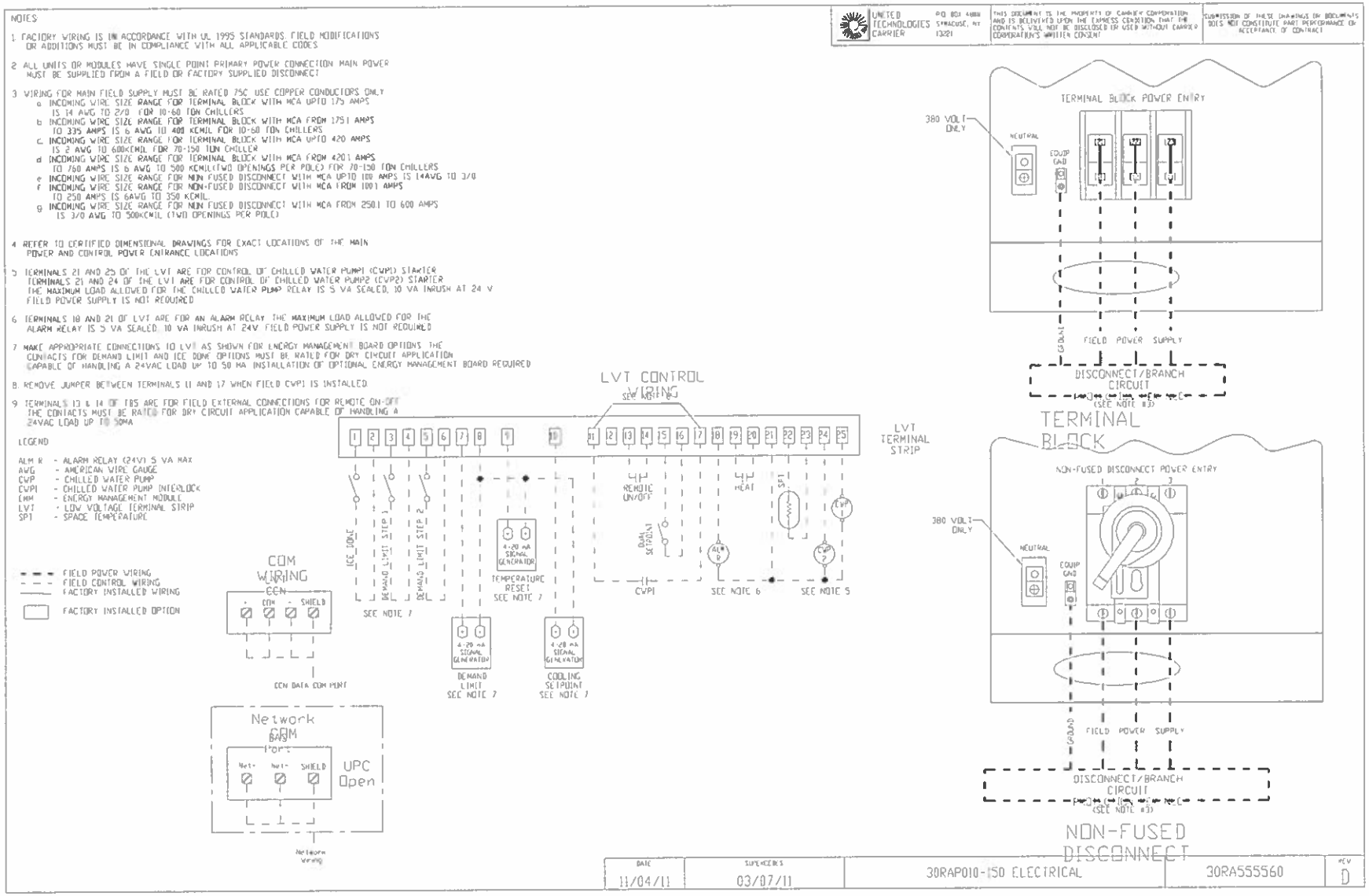
First Year - Parts Only (Standard)

Ordering Information

Part Number	Description	Quantity
30RAP03051-00500	Packaged Chiller	1
	Base Unit	
	Evaporator Heater	
	Cu Fin/Cu Tube	
	Value Sound - Metal Fans	
	Single Point	
	Fixed Speed Condenser Fan	



UNIT	CENTER OF GRAVITY		UNIT HEIGHT		POWER ENTRY	WATER CONNECTION VICTAULIC IPS CARBON STEEL
	X	Y	H (STANDARD)	H (VALUE SOUND)	P	WATER IN/OUT
30RAQ18	18.37 [467]	38.77 [985]	66.5 [1689]	61.0 [1549]	24.9 [631]	2"
30RAQ20	18.38 [467]	38.79 [985]	66.5 [1689]	61.0 [1549]	24.9 [631]	2"
30RAQ25	18.58 [472]	38.93 [989]	78.5 [1994]	73.0 [1854]	36.9 [936]	2"
30RAQ30	18.59 [472]	38.98 [990]	78.5 [1994]	73.0 [1854]	36.9 [936]	2"


NOTES
1 FACTORY WIRING IS IN ACCORDANCE WITH UL 1995 STANDARDS. FIELD MODIFICATIONS OR ADDITIONS MUST BE IN COMPLIANCE WITH ALL APPLICABLE CODES
2 ALL UNITS OR MODULES HAVE SINGLE POINT PRIMARY POWER CONNECTION MAIN POWER MUST BE SUPPLIED FROM A FIELD OR FACTORY SUPPLIED DISCONNECT
3 WIRING FOR MAIN FIELD SUPPLY MUST BE RATED 75C USE COPPER CONDUCTORS ONLY
a INCOMING WIRE SIZE RANGE FOR TERMINAL BLOCK WITH MCA UPTO 175 AMPS IS 14 AWG TO 2/0 FOR 10-60 TON CHILLERS
b INCOMING WIRE SIZE RANGE FOR TERMINAL BLOCK WITH MCA FROM 175 AMPS TO 335 AMPS IS 6 AWG TO 400 KCMIL FOR 10-60 TON CHILLERS
c. INCOMING WIRE SIZE RANGE FOR TERMINAL BLOCK WITH MCA UPTO 420 AMPS IS 2 AWG TO 600KCMIL FOR 70-150 TON CHILLER
d INCOMING WIRE SIZE RANGE FOR TERMINAL BLOCK WITH MCA FROM 420 AMPS TO 760 AMPS IS 6 AWG TO 500 KCMIL(TWO OPENINGS PER POLE) FOR 70-150 TON CHILLERS
e INCOMING WIRE SIZE RANGE FOR NON FUSED DISCONNECT WITH MCA UP TO 100 AMPS IS 14AWG TO 3/0
f INCOMING WIRE SIZE RANGE FOR NON-FUSED DISCONNECT WITH MCA FROM 100 AMPS TO 250 AMPS IS 6AWG TO 350 KCMIL
g INCOMING WIRE SIZE RANGE FOR NON FUSED DISCONNECT WITH MCA FROM 250 TO 600 AMPS IS 3/0 AWG TO 500KCMIL (TWO OPENINGS PER POLE)
4 REFER TO CERTIFIED DIMENSIONAL DRAWINGS FOR EXACT LOCATIONS OF THE MAIN POWER AND CONTROL POWER ENTRANCE LOCATIONS
5 TERMINALS 21 AND 23 OF THE LVT ARE FOR CONTROL OF CHILLED WATER PUMP1 (CWP1) STARTER TERMINALS 21 AND 24 OF THE LVT ARE FOR CONTROL OF CHILLED WATER PUMP2 (CWP2) STARTER THE MAXIMUM LOAD ALLOWED FOR THE CHILLED WATER PUMP RELAY IS 5 VA SEALED, 10 VA INRUSH AT 24 V FIELD POWER SUPPLY IS NOT REQUIRED
6 TERMINALS 18 AND 21 OF LVT ARE FOR AN ALARM RELAY THE MAXIMUM LOAD ALLOWED FOR THE ALARM RELAY IS 5 VA SEALED, 10 VA INRUSH AT 24V FIELD POWER SUPPLY IS NOT REQUIRED
7 MAKE APPROPRIATE CONNECTIONS TO LVT AS SHOWN FOR ENERGY MANAGEMENT BOARD OPTIONS THE CONTACTS FOR DEMAND LIMIT AND ICE DONE OPTIONS MUST BE RATED FOR DRY CIRCUIT APPLICATION CAPABLE OF HANDLING A 24VAC LOAD UP TO 50 MA INSTALLATION OF OPTIONAL ENERGY MANAGEMENT BOARD REQUIRED
8. REMOVE JUMPER BETWEEN TERMINALS 11 AND 17 WHEN FIELD CWP1 IS INSTALLED
9 TERMINALS 13 & 14 OF TB5 ARE FOR FIELD EXTERNAL CONNECTIONS FOR REMOTE ON-OFF THE CONTACTS MUST BE RATED FOR DRY CIRCUIT APPLICATION CAPABLE OF HANDLING A 24VAC LOAD UP TO 50MA
LEGEND
ALM R - ALARM RELAY (24V) 5 VA MAX
AWG - AMERICAN WIRE GAUGE
CWP - CHILLED WATER PUMP
CWPI - CHILLED WATER PUMP INTERLOCK
EMM - ENERGY MANAGEMENT MODULE
LVT - LOW VOLTAGE TERMINAL STRIP
SPT - SPACE TEMPERATURE
FIELD POWER WIRING
FIELD CONTROL WIRING
FACTORY INSTALLED WIRING
FACTORY INSTALLED OPTION
UNITED TECHNOLOGIES CARRIER
PO BOX 4808 SYRACUSE, NY 13221
THIS DOCUMENT IS THE PROPERTY OF CARRIER CORPORATION AND IS DELIVERED UPON THE EXPRESS CONDITION THAT THE CONTENTS WILL NOT BE DISCLOSED IN USED WITHOUT CARRIER CORPORATION'S WRITTEN CONSENT
SUBMISSION OF THESE DRAWINGS OR DOCUMENTS DOES NOT CONSTITUTE PART PERFORMANCE OR ACCEPTANCE OF CONTRACT
LVT CONTROL WIRING
SEE NOTE 9
LVT TERMINAL STRIP
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
ICE_DONE
DEMAND LIMIT STEP 1
DEMAND LIMIT STEP 2
SEE NOTE 7
4-20 mA SIGNAL GENERATOR
TEMPERATURE RESET SEE NOTE 7
REMOTE ON/OFF
DUAL SETPOINT
CWP1
SEE NOTE 6
HEAT
SPT
CWP
SEE NOTE 5
COM WIRING
CCN
COM
SHIELD
CCN DATA COM PORT
DEMAND LIMIT SEE NOTE 7
COOLING SETPOINT SEE NOTE 7
Network COM BASM Ports
Net+
Net-
SHIELD
UPC Open
Network wiring
TERMINAL BLOCK POWER ENTRY
380 VOLT ONLY
NEUTRAL
EQUIP GND
GROUND
FIELD POWER SUPPLY
DISCONNECT/BRANCH CIRCUIT
(SEE NOTE #3)
TERMINAL BLOCK
NON-FUSED DISCONNECT POWER ENTRY
380 VOLT ONLY
NEUTRAL
EQUIP GND
GROUND
FIELD POWER SUPPLY
DISCONNECT/BRANCH CIRCUIT
(SEE NOTE #3)
NON-FUSED DISCONNECT
DATE 11/04/11
SUPERCEDES 03/07/11
30RAP010-150 ELECTRICAL
30RA555560
REV D

Summary Performance Report For CHILLER

Project: Guam Homeland Security - GSA 01/30/2023
Prepared By: 06:59PM

AQUASNAP

Carrier

AquaSnap™ Air-Cooled Scroll Chiller

Unit Information

Tag Name:	**CHILLER**	
Model Number:	**30RAP030**	
Quantity:	**1**	
Manufacturing Source:	**Charlotte, NC USA**	
ASHRAE 90.1:	**2010, 2007**	
Refrigerant:	**R-410A**	
Independent Refrigerant Circuits:	**1**	
Shipping Weight:	**1527**	lb
Operating Weight:	**1548**	lb
Refrigerant Weight (Circuit A):	**39**	lb
Unit Length:	**89**	in
Unit Width:	**41**	in
Unit Height:	**79**	in
Chiller Pressure Drop*:	**17.2**	ft H2O

*Use Chiller Pressure Drop for sizing pumps. This value includes losses due to chiller piping, fittings, 40 mesh factory supplied strainer and BPHX.

Evaporator Information

Fluid Type:	**Fresh Water**	
Fouling Factor:	**0.000100**	(hr-sqft-F)/BTU
Leaving Temperature:	**44.00**	°F
Entering Temperature:	**54.00**	°F
Fluid Flow:	**66.44**	gpm
Evaporator Pressure Drop*:	**11.3**	ft H2O

*Refer to Chiller Pressure Drop for sizing pumps.

Condenser Information

Altitude:	**0.000**	ft
Number of Fans:	**2**	
Total Condenser Fan Air Flow:	**20,900**	CFM
Entering Air Temperature:	**95.0**	°F

Integrated Pump Information

No Pump Selected

Performance Information

Cooling Capacity:	**27.78**	Tons
Total Compressor Power:	**30.92**	kW
Total Fan Motor Power:	**3.190**	kW
Total Unit Power (without pump):	**34.11**	kW
Efficiency (without pump) (EER):	**9.773**	BTU/Wh
IPLV:.IP:	**14.92**	BTU/Wh

Accessories and Installed Options

Evaporator Heater
Cu Fin/Cu Tube
Value Sound - Metal Fans
Single Point
Fixed Speed Condenser Fan

Electrical Information

Unit Voltage:	**208/230-3-60**	V-Ph-Hz
Connection Type:	**Single Point**	
SCCR:	**5**	kA

Amps	Electrical Circuit 1	Electrical Circuit 2
MCA	138.8	---
MOCP	175.0	---
ICF	409.0	---
Rec Fuse Size	175.0	---

Sound power measured in accordance with ANSI/AHRI Standard 370-2015.

Certified in accordance with the AHRI Air-Cooled Water-Chilling Packages Certification Program, which is based on AHRI Standard 550/590 (I-P) and AHRI Standard 551/591 (SI). Certified units may be found in the AHRI Directory at www.ahridirectory.org.

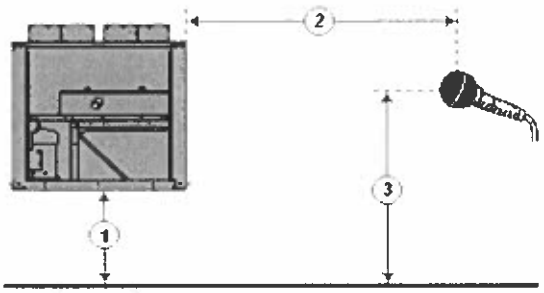
Summary Performance Report For CHILLER

Project: Guam Homeland Security - GSA
Prepared By:

01/30/2023
06:59PM

Unit Parameters

Tag Name:	**CHILLER**	
Model Number:	**30RAP030**	
Condenser Type:	**Air Cooled**	
Compressor Type:	**Scroll**	
Chiller Nameplate Voltage:	**208/230-3-60**	V-Ph-Hz
Quantity:	**1**	
Manufacturing Source:	**Charlotte, NC USA**	
Refrigerant:	**R-410A**	
Shipping Weight:	**1527**	lb
Operating Weight:	**1548**	lb
Refrigerant Weight (Circuit A):	**39**	lb
Unit Length:	**89**	in
Unit Width:	**41**	in
Unit Height:	**79**	in



1 - Chiller Height Above Ground
2 - Horizontal Distance From Chiller to Receiver
3 - Receiver Height Above Ground
(See Note 3)

Accessories and Installed Options

Evaporator Heater
Cu Fin/Cu Tube
Value Sound - Metal Fans

Single Point
Fixed Speed Condenser Fan

Acoustic Information

Table 1. A-Weighted Sound Power Levels (dB re 1 picowatt). See note #1.

Octave Band Center Frequency, Hz	31	63	125	250	500	1k	2k	4k	8k	Overall
100% Load	---	70	77	84	89	90	88	85	79	95
75% Load	---	70	77	84	89	90	88	85	79	95
50% Load	---	70	77	84	89	90	87	84	79	95
25% Load	---	67	74	81	86	87	85	82	76	92

Table 2. A-Weighted Sound Pressure Levels (dB re 20 micropascals) calculated based upon user defined input for dimensions 1, 2 and 3 as shown in above diagram. See note #2 and #3.

Octave Band Center Frequency, Hz	31	63	125	250	500	1k	2k	4k	8k	Overall
100% Load	---	43	50	56	62	62	60	57	51	67
75% Load	---	43	50	56	62	62	60	57	51	67
50% Load	---	42	50	56	62	62	60	57	51	67
25% Load	---	40	47	53	59	59	57	54	48	64

Notes: (1) Measurements performed in accordance with AHRI Standard 370-2015 for air cooled Chillers.
(2) Chiller is assumed to be a point source on a reflecting plane.
(3) Without user defined input, the default dimensions used to construct Table 2 are as follows:
1 - Chiller Height Above Ground = 0.0 ft
2 - Horizontal Distance From Chiller to Receiver = 30.0 ft
3 - Receiver Height Above Ground = 3.0 ft

GUIDE SPECIFICATIONS – 30RAP03051-00500

HVAC Guide Specifications
Air-Cooled Liquid Chiller

Size: 030

Part 1: General

SYSTEM DESCRIPTION

1.01. Microprocessor controlled, air-cooled liquid chiller for outdoor installation, utilizing scroll compressors, low sound fans, electronic expansion valve, optional hydronic pump system, and fluid storage tank (storage tank on models 010-060 only).

QUALITY ASSURANCE

1.01. Unit shall be rated in accordance with AHRI (Air- Conditioning, Heating and Refrigeration Institute) Standard 550/590, latest edition (U.S.A.) and all units shall be ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) 90.1 compliant.

1.02. Unit construction shall comply with ASHRAE 15 Safety Code, UL latest edition, and ASME (American Society of Mechanical Engineers) applicable codes (U.S.A. codes).

1.03. Unit shall be manufactured in a facility registered to ISO 9001 Manufacturing Quality Standard.

1.04. Unit shall be full load run tested at the factory.

DELIVERY, STORAGE AND HANDLING

1.01. Unit controls shall be capable of withstanding 150 F (66 C) storage temperatures in the control compartment.

1.02. Unit shall be stored and handled per unit manufacturer's recommendations.

Part 2: Products

EQUIPMENT

2.01. General:

A. Factory assembled, single-piece chassis, air-cooled liquid chiller. Contained within the unit cabinet shall be all factory wiring, piping, controls, refrigerant charge (R-410A), and special features required prior to field start-up.

2.02. Unit Cabinet:

A. Frame shall be of heavy-gage, galvanized steel.

B. Exterior panels shall be galvanized steel with a baked enamel powder or pre-painted finish.

C. Cabinet shall be capable of withstanding 500-hour salt spray test in accordance with the ASTM (American Society for Testing and Materials, U.S.A.) B-117 standard.

2.03. Fans:

A. Standard condenser fans shall be direct-driven, 9-blade airfoil cross-section, reinforced polymer construction, shrouded-axial type, and shall be statically and dynamically balanced with inherent corrosion resistance.

B. Fan operation shall allow reduced sound levels during scheduled unoccupied operating periods. Manufacturers without unoccupied reduced sound capability shall submit 1/3 octave band data and sound power data as measured according to AHRI 370 as confirmation of unit sound characteristics.

C. Air shall be discharged vertically upward.

D. Fans shall be protected by coated steel wire safety guards.

2.04. Compressor/Compressor Assembly:

A. Fully hermetic, direct-drive, scroll type compressors.
B. Compressor motors shall be cooled by refrigerant gas passing through motor windings and shall have either internal line break thermal and current overload protection or external current overload modules with compressor temperature sensors.
C. Compressors shall be mounted on rubber in shear vibration isolators.
D. Staging of compressors shall provide unloading capability.
E. Crankcase heaters are not required on sizes 010-060 due to very low refrigerant charge.

2.05. Cooler:

A. Cooler shall be rated for a refrigerant working-side pressure of 565 psig (3896 kPa) and shall be tested for a maximum waterside pressure of 300 psig (2068 kPa) or 150 psig (1034 kPa) when optional hydronic package is installed.
B. Shall be single-pass, ANSI (American National Standards Institute) type 316 stainless steel, brazed plate construction.
C. Shell shall be insulated with 3/4-in. (19 mm) closed-cell, polyvinyl-chloride foam with a maximum K factor of 0.28.
D. Shall have one independent refrigerant circuit.
E. Unit shall be provided with a factory-installed flow switch.
F. All connections shall use standard Victaulic-type fittings.
G. Cooler fluid inlet line shall have a 40 mesh strainer just ahead of the cooler.

2.06. Condenser:

A. Coil shall be air-cooled Novation® heat exchanger technology with microchannel (MCHX) coils and shall have a series of flat tubes containing a series of multiple, parallel flow microchannels layered between the refrigerant manifolds.
B. Coils shall consist of a two-pass arrangement. Coil construction shall consist of aluminum alloys for fins, tubes, and manifolds in combination with a corrosion-resistant coating.
C. Tubes shall be cleaned, dehydrated, and sealed.
D. Assembled condenser coils shall be leak tested and pressure tested at 656 psig (4522 kPa).

2.07. Refrigeration Components:

A. Refrigerant circuit components shall include filter drier, moisture indicating sight glass, electronic expansion device, and complete operating charge of both refrigerant R-410A and compressor oil.

2.08. Controls, Safeties, and Diagnostics:

A. Unit controls shall include the following minimum components:
   1. Microprocessor with non-volatile memory. Battery backup system shall not be accepted.
   2. Separate terminal block for power and controls.
   3. Control transformer to serve all controllers, relays, and control components.
   4. ON/OFF control switch.
   5. Replaceable solid-state controllers.
   6. Pressure sensors shall be installed to measure suction and discharge pressure for each circuit. Thermistors shall be installed to measure cooler entering and leaving fluid temperatures, outdoor ambient temperature, and suction temperature. Provision for field installation of accessory sensor to measure compressor return gas temperature.
B. Unit controls shall include the following functions:
   1. Automatic circuit lead/lag for dual circuit chillers.
   2. Hermetic scroll compressors are maintenance free and protected by an auto-adaptive control that minimizes compressor wear.
   3. Capacity control based on leaving chilled fluid temperature and compensated by rate of change of return-fluid temperature with temperature set point accuracy to 0.1° F (0.06° C).
   4. Limiting the chilled fluid temperature pulldown rate at start-up to an adjustable range of 0.2° F to 2° F (0.11° C to 1.1° C) per minute to prevent excessive demand spikes at start-up.
   5. Seven-day time schedule.
   6. Leaving chilled fluid temperature reset from return fluid and outside air temperature.
   7. Chilled water pump start/stop control and primary/standby sequencing to ensure equal pump run time.
   8. Dual chiller control for parallel chiller applications without addition of hardware modules and control panels

(additional thermistors and wells are required).

9. Timed maintenance scheduling to signal maintenance activities for pumps, condenser coil cleanings, strainer maintenance and user-defined maintenance activities.
10. Boiler enable signal to initiate system heating mode.
11. Low ambient protection to energize cooler and hydronic system heaters.
12. Periodic pump start to ensure pump seals are properly maintained during off-season periods.
13. Single step demand limit control activated by remote contact closure.
14. Nighttime sound mode to reduce the sound of the machine by a user-defined schedule.

C. Diagnostics:
   1. The control panel shall include, as standard, a scrolling marquee display capable of indicating the safety lockout condition by displaying a code for which an explanation may be scrolled at the display.
   2. Information included for display shall be:
      a. Compressor lockout.
      b. Loss of charge.
      c. Low fluid flow.
      d. Cooler freeze protection.
      e. Cooler set point.
      f. Chilled water reset parameters.
      g. Thermistor and transducer malfunction.
      h. Entering and leaving-fluid temperature.
      i. Compressor suction temperature.
      j. Evaporator and condenser pressure.
      k. System refrigerant temperatures.
      l. Chiller run hours.
      m. Compressor run hours.
      n. Compressor number of starts.
      o. Low superheat.
      p. Time of day:
         I) Display module, in conjunction with the microprocessor, must also be capable of displaying the output (results) of a service test. Service test shall verify operation of every switch, thermistor, fan, and compressor before chiller is started.
         II) Diagnostics shall include the ability to review a list of the 20 most recent alarms with clear language descriptions of the alarm event. Display of alarm codes without the ability for clear language descriptions shall be prohibited.
         III) An alarm history buffer shall allow the user to store no less than 20 alarm events with clear language descriptions, time and date stamp event entry.
         IV) The chiller controller shall include multiple connection ports for communicating with the local equipment network, the Carrier Comfort Network® (CCN) system and access to chiller control functions from any point on the chiller.
         V) The control system shall allow software upgrade without the need for new hardware modules.

D. Safeties:
   1. Unit shall be equipped with thermistors and all necessary components in conjunction with the control system to provide the unit with the following protections:
      a. Loss of refrigerant charge.
      b. Reverse rotation.
      c. Low chilled fluid temperature.
      d. Thermal overload.
      e. High pressure.

f. Electrical overload.

2. Factory pump motors shall have external overcurrent protection.

2.09. Operating Characteristics:

A. Unit shall be capable of starting and operating down to 45 F (7 C) as standard.

B. Unit shall be capable of starting and running at outdoor ambient temperatures up to 120 F (50 C) for all sizes. Unit shall additionally be able to stay online when running with a 125 F (52 C) ambient temperature.

C. Unit shall be capable of starting up with 95 F (35 C) entering fluid temperature to the cooler.

2.10. Fan Motors:

A. Condenser fans shall be direct-drive Aero-Acoustic™ type, discharging air vertically upward.

B. All condenser fan motors shall be totally enclosed 3-phase type with permanently lubricated ball bearings, Class F insulation and internal, automatic reset thermal overload protection or manual reset calibrated circuit breakers.

C. Shafts shall have inherent corrosion resistance.

D. Fan blades shall be statically and dynamically balanced.

E. Condenser fan openings shall be equipped with PVC coated steel wire safety guards.

2.11. Electrical Requirements:

A. Unit/module primary electrical power supply shall enter the unit at a single electrical box.

B. Unit shall operate on 3-phase power at the voltage shown in the equipment schedule.

C. Control points shall be accessed through terminal block.

D. Unit shall be shipped with factory control and power wiring installed.

2.12. Chilled Water Circuit:

A. Chilled water circuit shall be rated for 300 psig (2068 kPa) working pressure.

B. Solid-state flow monitor with integral relay shall be factory installed and wired.

C. Brass body strainer with 40 mesh screen and ball type blow down.

2.13. Special Features:

A. Optional Condenser Coil Materials:

1. E-coated aluminum-fin coils:

a. Coil shall have a flexible epoxy polymer coat[1]ing uniformly applied to all coil surface areas without material bridging between fins. Coat[1]ing process shall ensure complete coil encap[1]sulation. Color shall be high gloss black with gloss; 60° of 65 to 90% per ASTM ID523- 89. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges. Superior hardness characteristics of 2H per ASTM D3363-92A and cross hatch adhesion of 4B-5B per ASTM D3359-93. 102 Impact resistance shall be up to 160 in./lb (ASTM D2794-93). Humidity and water immersion resistance shall be up to minimum 1000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to no less than 3000 hours salt spray per ASTM B117-90. Coil construction shall be aluminum fins mechanically bonded to cop[1]per tubes.