Seth Forman
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Attorneys for Appellant
All Business Enterprises Corp.

OFFICE OF PUBLIC ACCOUNTABILITY

PROCUREMENT APPEAL

In the Appeal of	)	**APPELLANT'S EXHIBITS**
	)	
All Business Enterprises Corp.,	)	
	)	Docket No. OPA-PA-22-002
Appellant.	)	
	)	

Seth Forman
Roberts Fowler & Visosky LLP
865 South Marine Corps Drive, Ste. 201
Tamuning, Guam 96913
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Attorneys for Appellant
All Business Enterprises Corp.

OFFICE OF PUBLIC ACCOUNTABILITY

PROCUREMENT APPEAL

In the Appeal of All Business Enterprises Corp., Appellant.	)	**APPELLANT'S EXHIBIT LIST** Docket No. OPA-PA-22-002

Appellant provides the following Exhibit List for the Hearing in this matter:

Exhibit 1 Abstract Analysis and Notice of Intent to Award

Exhibit 2 Notice of Award

Exhibit 3 Notice of Rejection of ABE bid

Exhibit 4 Excerpts from Bid Specifications (including paragraphs 2.2.1.1, 2.2.4.1, 2.6.2.1, and 2.7.2.1)

Exhibit 5 Excerpts from Tony's Workshop submittal omitting Factory Phenolic Coating

5-1 Unit Report for RFK Building First Floor Main Entrance 112321; Ref: page 29 of 178

5-2 Unit Report for 7.5 RFK Building First Floor AV Room 112321; Ref: page 43 of 178

5-3 Unit Report for 7.5 RFK Building First Floor Office 112321; Ref: page 56 of 178

5-4 Unit Report for PIP (GLE) Second Floor 112321; Ref: page 69 of 178

5-5 Unit Report for 20 Science Building Third Floor 112321; Ref: page 106 of 178

5-6 Unit Report for Lecture Hall Auditorium 112321; Ref: page 143 of 178

Exhibit 6 Excerpts from Tony's Workshop submittal including Factory Phenolic Coating

Exhibit 7 Excerpts from JWS submittal omitting Factory Phenolic Coating

Exhibit 8 Excerpts from Tony's Workshop submittal showing aluminum instead of copper

Exhibit 9 Excerpts from JWS submittal showing aluminum instead of copper

Exhibit 10 ABE submittal data showing compliance with bid specifications

10-1 Data for 50 ton unit

10-2 Data for 40 ton unit

10-3 Data for 30 ton unit

10-4 Data for 20 ton unit

10-5 Data for 15 ton unit

Exhibit 11 Carrier advertisement saying microchannel is entirely aluminum

Exhibit 12 Differences between aluminum and copper condensing coils

Respectfully submitted,

ROBERTS FOWLER & VISOSKY LLP

Date: 4/18/2022

By: Seth Forman

SETH FORMAN
Attorneys for Appellant All Business Enterprises Corp.

EXHIBIT 1

Gene Bangayan

From: Nel Bangayan
Sent: Monday, December 6, 2021 5:07 PM
To: Gene Bangayan
Subject: FW: UOG IFB B21-17 : Purchasing of HVAC Equipment - BID ABSTRACT ANALYSIS & NOTICE OF INTENT TO AWARD
Attachments: B21-17 ABSTRACT ANALYSIS_BID OPENING 12.06.2021 315PM.pdf; B21-17_NOTICE OF INTENT TO AWARD_TONY's WORKSHOP.pdf

Nelia Bangayan

J&B MODERN TECH
AGRI EQUIPMENT AND SUPPLIES

From: UOG Procurement Bids [mailto:uog.bids@triton.uog.edu]
Sent: Monday, December 06, 2021 5:03 PM
To: Procurement Office
Subject: UOG IFB B21-17 : Purchasing of HVAC Equipment - BID ABSTRACT ANALYSIS & NOTICE OF INTENT TO AWARD

Håfa Adai & Good Afternoon,

See attached for your reference.

Please confirm receipt. Thank you!

Si Yu'os ma'åse' & Have a nice day!,

UNIVERSITY OF GUAM

Respectfully,

UOG Procurement
Office: 671-735-2925
Fax: 671-735-3010
uog.bids@triton.uog.edu

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UNIVERSITY OF GUAM
UNIBETSEDÅT GUÅHAN

ADMINISTRATION & FINANCE
Consolidated Procurement Office

ABSTRACT ANALYSIS
UOG IFB BID NO. B21-17
Title: PURCHASING OF HVAC EQUIPMENT

Date Issued: 10/22/2021 Date/Time Opened: 12/06/2021/ 3:15 p.m.
Amendments Issued: Amendment 1 10/29/2021, **Amendment 2** 10/29/2021, **Amendment 3** 11/19/2021, **Amendment 4** 11/22/2021, **Amendment 5** 11/24/2021, & **Amendment 6** 12/03/2021
This Bid is requested for: Lowest Responsive and Responsible Bidder

	VENDORS/BIDDERS		
	ALL BUSINESS ENTERPRISE	**JWS**	**TONY'S WORKSHOP**
Date Bid Submitted	**12/06/2021**	**12/06/2021**	**12/06/2021**
Time Bid Submitted	**11:31**	**11:33**	**1:21 PM**
Business License	X	NOT INCLUDED	NOT INCLUDED
Contact for Contract Administration (B)	X	X	X
Bidder's Qualifications (C)	X	X	X
BID SECURITY (D)	CC – $218,410.00	CC – $98,785.80	BB
Major Shareholder Affidavit (E)	X	X	X
Non-Collusion Affidavit (F)	X	X	X
Gratuities, Kickbacks Favors (G)	X	X	X
Ethical Standards (H)	X	X	X
DOL Wage Determination (I)	X	X	X
Contingent Fees (J)	X	X	X
Amendment 1	X	X	X
Amendment 2	X	X	X
Amendment 3	X	X	X
Amendment 4	X	X	X
Amendment 5	X	X	X
Amendment 6	X	X	X

Table 1.0

RFK BUILDING SECOND FLOOR	$120,002.50	$74,837.72	$55,372.32
RFK BUILDING FIRST FLOOR	$107,574.60	$59,870.18	$52,856.01
RFK BUILDING FIRST FLOOR MAIN ENTRANCE	$67,372.50	$22,451.32	$17,711.51
RFK BUILDING FIRST FLOOR AV ROOM	$67,372.50	$22,451.32	$17,711.51
RFK BUILDING FIRST FLOOR OFFICES	$80,461.60	$29,935.09	$24,262.45
PIP SECOND FLOOR	$80,461.60	$29,935.09	$24,262.45
SCIENCE BUILDING FIRST FLOOR	$107,574.60	$59,870.18	$52,856.01
SCIENCE BUILDING SECOND FLOOR	$107,574.60	$59,870.18	$52,856.01
SCIENCE BUILDING THIRD FLOOR	$80,461.60	$29,935.09	$24,262.45
ENGLISH COMMUNICATION BUILDING CLASSROOM	$983,59.60	$44,902.64	$36,503.19
COMPUTER CENTER OIT BUILIDING FIRST FLOR	$120,002.50	$74,837.73	$55,372.32
LECTURE HALL AUDITORIUM	$80,461.60	$29,935.09	$24,262.45
HSS BUILDING	$240,005.00	$74,837.73	$110,134.64
HSS BUILDING	$98,359.60	$44,902.64	$36,503.19
GRAND TOTAL	**$1,456,044.40**	**$658,572.00**	**$584,926.51**

DELIVERY	18-20 WEEKS	9-12 WEEKS	24 WEEKS

TABLE 2.0

Service for Maintenance and upkeep	$51,000.00	$1,275.00 QUARTER $5,100.00 ANNUAL	$26,000.00 QUARTER
Services for disposal	$11,250.00	INCLUSIVE	$54,148.63
Replacement/trade in program	TO BE DISCUSSED UPON AWARD.	1 YEAR WARRANTY	$196,766.42

Attendees: (Print name & sign opposite the firm you represent)

Company/Firm Name	Representative (Print Name)	Signature
All Business Enterprises Corporation	Nelia Bangayan	ONLINE ZOOM
Tony's Workshop	Michael Ecalnea	ONLINE ZOOM
All Business Enterprises Corporation	Gene Bangayan	ONLINE ZOOM
JWS	Anthony Scragg	ONLINE ZOOM

Tabulators:

Emily G. Gumataotao	SMA	ONLINE ZOOM
Kaimana K. Terlaje	Property Control Officer	ONLINE ZOOM

UNIVERSITY OF GUAM
UNIBETSEDÅT GUÅHAN

ADMINISTRATION & FINANCE
Consolidated Procurement Office

December 6, 2021

Michael SJ. Ecalnea
P.O. Box 23066 GMF
Barrigada, Guam 96921
Main: 671-637-3060
Email: mike@tonysworkshop.com / tonyworkshop@teleguam.net

RE: **NOTICE OF INTENT TO AWARD- B21-17: PURCHASING OF HVAC EQUIPMENT**

Dear Sir/Madam:

As a result of our analysis on the above-referenced IFB, your bid submission for **PURCHASING OF HVAC EQUIPMENT**, is being considered for possible award, pending submission of requirements below:

1) *Copy of Guam Business License*
2) *Data Brochure of equipment being offered*

Please submit the above to the procurement office via email NLT Tuesday, December 7, 2021 by noon. Please be advised that this notice should not be construed as an award.

You can contact me at 735-2925 or email: uog.bids@triton.uog.edu if you have any questions regarding this notice.

Sincerely,

Emily G. Gumataotao
Supply Management Administrator

Please acknowledge receipt and return by email to uog.bids@triton.uog.edu

_____

(Print/Sign) Date

cc: Procurement Files

EXHIBIT 2

UNIVERSITY OF GUAM
UNIBETSEDÅT GUÅHAN

ADMINISTRATION & FINANCE
Consolidated Procurement Office

December 7, 2021

TONY's WORKSHOP
P.O. Box 23066 GMF
Barrigada, Guam 96921
Main: 671-637-3060
Email: mike@tonysworkshop.com / tonyworkshop@teleguam.net

RE: **NOTICE OF AWARD- UOG IFB B21-17: "PURCHASING OF HVAC EQUIPMENT"**

Dear Sir/Madam:

This letter is to certify that **TONY's WORKSHOP** is being awarded the University of Guam IFB **BID B21-17.**

As a result of our evaluation on the above referenced IFB, a purchase order or contract will be forthcoming.

A representative from the respective unit will be in contact with you upon issuance of the purchase order and/or contract.

If you have any questions, please feel free to contact me at 735-2925 or email at uog.bids@triton.uog.edu.

Thank you and Congratulations!

Sincerely,

Emily G. Gumataotao
Supply Management Administrator

Please acknowledge receipt and return via email to uog.bids@triton.uog.edu.

_____
(Please print name and sign) (DATE)

cc: FMS
PROCUREMENT FILES

EXHIBIT 3

UNIVERSITY OF GUAM
UNIBETSEDÅT GUÅHAN

ADMINISTRATION & FINANCE
Consolidated Procurement Office

BID STATUS

December 7, 2021

ALL BUSINESS ENTERPRISES CORPORATION
Nelia F. Bangayan, President
Ph 671-646-4435
Email nbangayan@abmoderntech.com

Subject: **UOG Invitation for Bid No. B21-17, "Purchasing of HVAC Equipment"**

Bid Open: December 6, 2021

/ Cancelled (in its entirety), or partially cancelled due to:
- ( ) Insufficient funds;
- ( ) Change of specifications, or
- ( ) Insufficient number of bidders

/X/ Rejected due to:
- ( ) Late submission of bid
- ( ) No bid security or insufficient bid security amount submitted, as required by General Terms and Conditions,
- ( ) Not meeting the delivery requirement as stated in the IFB
- ( ) Non-conformance with the specifications
- ( ) Inability to provide future maintenance and services to the equipment,
- (X) High price; or
- ( ) Other.

/X/ Bid is recommended for award to ***TONY's WORKSHOP***

Emily G. Gumataotao
Supply Management Administrator

Please Acknowledge Receipt and return to uog.bids@triton.uog.edu

VENDOR (Print name & signature) Date

T: +1 671.735.2925 F: +1 671.735.3010 W: www.uog.edu E: uog.bids@triton.uog.edu
Mailing Address: 303 University Drive UOG Station Mangilao, Guam 96913

Exhibit A

EXHIBIT 4

2.1.4 Safety Devices

Exposed moving parts, parts that produce high operating temperature, parts which may be electrically energized, and parts that may be a hazard to operating personnel must be insulated, fully enclosed, guarded, or fitted with other types of safety devices. Safety devices must be installed so that proper operation of equipment is not impaired. Welding and cutting safety requirements must be in accordance with AWS Z49.1.

2.2 EQUIPMENT

2.2.1 Large-Capacity Split-System Air Conditioners (Greater Than 65,000 Btu/h)

Provide an air-cooled, split system which employs a remote condensing unit, a separate indoor unit, and interconnecting refrigerant piping. Provide the air conditioning type unit conforming to applicable Underwriters Laboratories (UL) standards including UL 1995. Unit must be rated in accordance with ANSI/AHRI 210/240. Provide unit with necessary fans, air filters, and cabinet construction as specified in paragraph UNITARY EQUIPMENT ACCESSORIES. Provide double-width, double inlet, forward curved centrifugal scroll type evaporator or supply fans. Provide the manufacturer's standard for the unit specified and may be centrifugal scroll type condenser or outdoor fans. Enclose fan condenser motors in totally enclosed enclosures and permanently lubricate ball bearings. Air Conditioners must have a minimum energy efficiency ratio (EER) of 12.

2.2.1.1 Air-To-Refrigerant Coil

Provide coils with copper tubes of 3/8 inch minimum diameter with copper fins that are mechanically bonded or soldered to the tubes. Provide casing of galvanized steel. Avoid contact of dissimilar metals. Test coils in accordance with ASHRAE 15 & 34 at the factory and ensure suitability for the working pressure of the installed system. Dehydrate and seal each coil testing and prior to evaluation and charging. Provide each unit with a factory operating charge of refrigerant and oil. Field charge unit shipped with a holding charge with refrigerant and oil. Provide separate expansion devices for each compressor circuit. Condenser coil must have special coating for corrosion resistance. Condenser coil must be copper finned. Coat condenser and evaporator coil with a uniformly applied epoxy electrodeposition, phenolic, or vinyl type coating to all coil surface areas without material bridging between fins. Apply coating at either the coil or coating manufacturer's factory. Coating process must ensure complete coil encapsulation and be capable of withstanding a minimum 1,000 hours exposure to the salt spray test specified in ASTM B117 using a 5 percent sodium chloride solution.

2.2.1.2 Refrigeration Circuit

Refrigerant-containing components must comply with ASHRAE 15 & 34 and be factory tested, cleaned, dehydrated, charged, and sealed. Provide refrigerant charging valves and connections, and pumpdown valves foreach circuit.

2.2.1.3 Unit Controls

Provide unit internally prewired with a 208 volt control circuit powered by an internal transformer.

2.2.1.4 Condensing Unit

Fit each remote condenser coil with a manual isolation valve and an access valve on the coil side. Saturated refrigerant condensing temperature must not exceed 120 degrees F at 95 degrees F ambient. Fan and condensermotors must have totally enclosed enclosures.

2.2.1.4.1 Air-Cooled Condenser

Provide unit rated in accordance with ANSI/AHRI 460 and conform to the requirements of UL 1995. Provide factoryfabricated, tested, packaged, and self-contained unit. Unit must be complete with casing, propeller or centrifugal type fans, heat rejection coils, connecting piping and wiring, and all necessary appurtenances.

a. Provide interconnecting refrigeration piping, electrical power, and control wiring between thecondensing unit and the indoor unit as required and as indicated. Provide electrical and refrigeration piping terminal connections between condensing unit and evaporator units.

b. Low ambient control for multi-circuited units serving more than one evaporator coil must provide independent condenser pressure controls for each refrigerant circuit. Set controls to produce a minimum of 95 degrees F saturated refrigerant condensing temperature. Provide unitwith a liquid subcooling circuit that ensures proper liquid refrigerant flow to the expansion device over the specified application range of the condenser. Unit must be provided with manufacturer's standard liquid subcooling. Liquid seal the subcooling circuit.

c. Coils must have copper tubes of 3/8 inch minimum diameter with copper fins that are mechanically bonded or soldered to the tubes. Protect coil in accordance with paragraph COIL CORROSION PROTECTION. Casing must be galvanized steel or aluminum. Avoid contact of dissimilar metals. Test coils in accordance with ASHRAE 15 & 34 at the factory and ensure suitability for the working pressure of the installed system. Dehydrate and seal each coil after testing and prior to evaluation and charging. Provide each unit with a factory operating charge ofrefrigerant and oil or a holding charge. Field charge unit shipped with a holding charge. Provide separate expansion devices for each compressor circuit.

d. Provide a complete control system with required accessories for regulating condenser pressure by fan cycling, solid-state variable fan speed, modulating condenser coil or fan dampers, floodingthe condenser, or a combination of the above. Construct unit mounted control panels or enclosures in accordance with applicable requirements of NFPA 70 and house in NEMA ICS 6, Class 1 or 3A enclosures. Controls must include overload protective devices, interface with local and remote components, and intercomponent wiring to terminal block points.

2.2.1.4.2 Compressors

2.6.2 Equipment and Components Factory Coating

Unless otherwise specified, equipment and component items, when fabricated from ferrous metal, must be factory finished with the manufacturer's standard finish, except that items located outside of buildings must haveweather resistant finishes that will withstand 500 hours exposure to the salt spray test specified in ASTM B117 using a 5 percent sodium chloride solution. Immediately after completion of the test, the specimen must show no signs of blistering, wrinkling, cracking, or loss of adhesion and no sign of rust creepage beyond 1/8 inch on either side of the scratch mark. Cut edges of galvanized surfaces where hot-dip galvanized sheet steel is used must be coated with a zinc-rich coating conforming to ASTM D520, Type I.

Where stipulated in equipment specifications of this section, coat finned tube coils of the affected equipment as specified below. Apply coating at the premises of a company specializing in such work. Degrease and prepare for coating in accordance with the coating applicator's procedures for the type of metals involved. Completed coating must show no evidence of softening, blistering, cracking, crazing, flaking, loss of adhesion, or "bridging" between the fins.

2.6.2.1 Phenolic Coating

Provide a resin base thermosetting phenolic coating. Apply coating by immersion dipping of the entire coil. Provide a minimum of two coats. Bake or heat dry coils following immersions. After final immersion and prior to final baking, spray entire coil with particular emphasis given to building up coating on sheared edges. Total dry film thickness must be 2.5 to 3.0 mils.

2.6.2.2 Chemical Conversion Coating with Polyelastomer Finish Coat

Dip coils in a chemical conversion solution to molecularly deposit a corrosion resistant coating by electrolysis action. Cure conversion coating at a temperature of 110 to 140 degrees F for a minimum of 3 hours. Coat coil surfaces with a complex polymer primer with a dry film thickness of 1 mil. Cure primer coat for a minimum of 1 hour. Using dip tank method, provide three coats of a complex polyelastomer finish coat. After each of the first two finish coats, cure the coils for 1 hour. Following the third coat, spray a fog coat of an inert sealer on the coil surfaces. Total dry film thickness must be 2.5 to 3.0 mils. Cure finish coat for a minimum of 3 hours. Coating materials must have 300 percent flexibility, operate in temperatures of minus 50 to plus 220 degrees F, and protect against atmospheres of a pH range of 1 to 14.

2.6.2.3 Vinyl Coating

Apply coating using an airless fog nozzle. For each coat, make at least two passes with the nozzle. Materials to be applied are as follows:

a. Total dry film thickness, 6.5 mils maximum

b. Vinyl Primer, 24 percent solids by volume: One coat 2 mils thick

Provide gaskets conforming to ASTM F104 - classification for compressed sheet with nitrile binder and acrylic fibers for maximum 700 degrees F service.

2.6.4 Bolts and Nuts

Bolts and nuts must be in accordance with ASTM A307. The bolt head must be marked to identify the manufacturer and the standard with which the bolt complies in accordance with ASTM A307.

2.7 FINISHES

2.7.1 Coil Corrosion Protection

Provide coil with a uniformly applied epoxy electrodeposition, phenolic, or vinyl type coating to all coil surface areas without material bridging between fins. Submit product data on the type coating selected, the coating thickness, the application process used, the estimated heat transfer loss of the coil, and verification of conformance with the salt spray test requirement. Coating must be applied at either the coil or coating manufacturer's factory. Coating process must ensure complete coil encapsulation. Coating must be capable of withstanding a minimum 1,000 hours exposure to the salt spray test specified in ASTM B117 using a 5 percent sodium chloride solution.

2.7.2 Equipment and Components Factory Coating

Unless otherwise specified, equipment and component items, when fabricated from ferrous metal, must be factory finished with the manufacturer's standard finish, except that items located outside of buildings must have weather resistant finishes that will withstand 500 hours exposure to the salt spray test specified in ASTM B117. Immediately after completion of the test, the specimen must show no signs of blistering, wrinkling, cracking, or loss of adhesion and no sign of rust creepage beyond 1/8 inch on either side of the scratch mark. Cut edges of galvanized surfaces where hot-dip galvanized sheet steel is used must be coated with a zinc-rich coating conforming to ASTM D520, Type I.

Where stipulated in equipment specifications of this section, coat finned tube coils of the affected equipment as specified below. Apply coating at the premises of a company specializing in such work. Degrease and prepare for coating in accordance with the coating applicator's procedures for the type of metals involved. Completed coating must show no evidence of softening, blistering, cracking, crazing, flaking, loss of adhesion, or "bridging" between the fins.

2.7.2.1 Phenolic Coating

Provide a resin base thermosetting phenolic coating. Apply coating by immersion dipping of the entire coil. Provide a minimum of two coats. Bake or heat dry coils following immersions. After final immersion and prior to final baking, spray entire coil with particular emphasis given to building up coating on sheared edges. Total dry film thickness must be 2.5 to 3.0 mils.

2.7.2.2 Chemical Conversion Coating with Polyelastomer Finish Coat

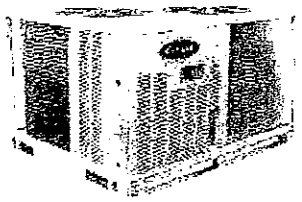
Dip coils in a chemical conversion solution to molecularly deposit a corrosion resistant coating by electrolysis action. Cure conversion coating at a temperature of 110 to 140 degrees F for a

EXHIBIT 5

EXHIBIT 5-1

Unit Report For 20RFK BUILDING FIRST FLOOR MAIN ENTRANCE 112321

Project: HA-1702-21-11 UOG IFB B21-17 PURCHASING HVAC EQUIP
Prepared By: BERNARD LLARENAS
02:16PM



Outdoor Unit Parameters

Unit Quantity	1	
Unit Model	38AUD	
Unit Size	15 Tons	
Voltage	208-3-60	V-Ph-Hz
Condenser Coil	Cu/Cu	
No. of Stages	Dual Stage	

System Parameter

System Quantity	1	
Refrigerant Type	PURON	
Compressor Quantity	2	
Compressor Type	Scroll	
Std. Capacity Steps	50, 100	
Std. Min. Outdoor Temp. Cooling	35.0	F
No. of Outdoor fans	3	

Outdoor Unit Dimensions and Weight

Unit Length	7' 2.4"	
Unit Width	3' 7.4"	
Unit Height	4' 2.4"	
Unit Shipping Weight	731	lb
Unit Operating Weight	731	lb

Warranty Information Outdoor (Note: for US & Canada only)
First Year - Parts Only (Standard)

NOTE: Please see Warranty Catalog 808-218 for explanation of policies and ordering methods.

Ordering Information

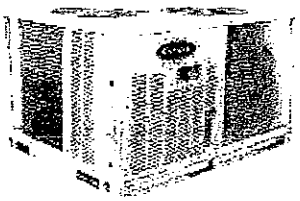
Part Number	Description	Quantity
Base Unit - Outdoor		
38AUDA16A0E5-0A0A0		
	Base Unit	1
	Cu/Cu Condensing Coil	
	Standard Refrigerant Options	1
	Service Options - None	1
	Electrical Options - None	1
	Packaging Options - Standard	1
	Standard Electrical Mechanical Controls	1
	Refrig Circ/Compressor Staging - Two Circuits/ Dual Stage	1
Accessories		1
EF680035	Liquid Line Solenoid Valve for Outdoor Unit	
EF680037	Liquid Line Solenoid Valve for Outdoor Unit	2
		2

EXHIBIT 5-2

Unit Report For 7.5RFK BUILDING FIRST FLOOR AV ROOM 112321

Project HA-1702-21-11 UOG IFB B21-17 PURCHASING HVAC EQUIP
Prepared By. BERNARD LLARENAS

02:16PM



Outdoor Unit Parameters

Unit Quantity	1	
Unit Model	38AUD	
Unit Size	15 Tons	
Voltage	208-3-60	V-Ph-Hz
Condenser Coil	Cu/Cu	
No. of Stages	Dual Stage	

System Parameter

System Quantity	1	
Refrigerant Type	PURON	
Compressor Quantity	2	
Compressor Type	Scroll	
Std Capacity Steps	50, 100	
Std Min Outdoor Temp-Cooling	35.0	°F
No. of Outdoor fans	3	

Outdoor Unit Dimensions and Weight

Unit Length	7' 2.4"	
Unit Width	3' 7.4"	
Unit Height	4' 2.4"	
Unit Shipping Weight	731	lb
Unit Operating Weight	731	lb

Warranty Information Outdoor (Note: for US & Canada only)
First Year - Parts Only (Standard)

NOTE: Please see Warranty Catalog 808-218 for explanation of policies and ordering methods.

Ordering Information

Part Number	Description	Quantity
Base Unit - Outdoor		
38AUDA16A0E5-0A0A0		
	Base Unit	1
	Cu/Cu Condensing Coil	
	Standard Refrigerant Options	1
	Service Options - None	1
	Electrical Options - None	1
	Packaging Options - Standard	1
	Standard Electrical Mechanical Controls	1
	Refrig Circ/Compressor Staging - Two Circuits/ Dual Stage	1
		1
Accessories		
EF680035	Liquid Line Solenoid Valve for Outdoor Unit	2
EF680037	Liquid Line Solenoid Valve for Outdoor Unit	2

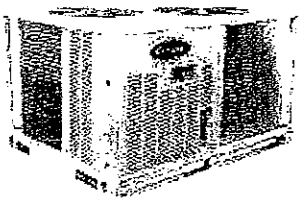
Exhibit F

EXHIBIT 5-3

Unit Report For 7.5RFK BUILDING FIRST FLOOR OFFICES 112321

Project HA-1702-21-11 UOG IFB B21-17 PURCHASING HVAC EQUIP
Prepared By: BERNARD LLARENAS

02:16PM



Outdoor Unit Parameters

Unit Quantity	1	
Unit Model:	38AUD	
Unit Size:	20 Tons	
Voltage	208-3-60	V-Ph-Hz
Condenser Coil	Cu/Cu	
No of Stages	Dual Stage	

System Parameter

System Quantity	1	
Refrigerant Type	PURON	
Compressor Quantity	2	
Compressor Type	Scroll	
Std Capacity Steps	50, 100	
Std Min Outdoor Temp(Cooling)	35.0	°F
No of Outdoor fans	4	

Outdoor Unit Dimensions and Weight

Unit Length	7' 2.1"	
Unit Width	5' 7.1"	
Unit Height	4' 2.4"	
Unit Shipping Weight	978	lb
Unit Operating Weight	978	lb

Warranty Information Outdoor (Note: for US & Canada only)
First Year - Parts Only (Standard)

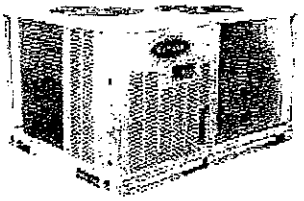
NOTE: Please see Warranty Catalog 808-218 for explanation of policies and ordering methods.

Ordering Information

Part Number	Description	Quantity
Base Unit - Outdoor		
38AUDA25A0E5-0A0A0		
	Base Unit	1
	Cu/Cu Condensing Coil	
	Standard Refrigerant Options	1
	Service Options - None	1
	Electrical Options - None	1
	Packaging Options - Standard	1
	Standard Electrical Mechanical Controls	1
	Refrig Circ/Compressor Staging - Two Circuits/ Dual Stage	1
		1
Accessories		
EF680035	Liquid Line Solenoid Valve for Outdoor Unit	2
EF680037	Liquid Line Solenoid Valve for Outdoor Unit	2

Exhibit G

EXHIBIT 5-4



Outdoor Unit Parameters

Unit Quantity	1	
Unit Model	38AUD	
Unit Size	20 Tons	
Voltage	208-3-60	V-Ph-Hz
Condenser Coil	Cu/Cu	
No of Stages	Dual Stage	

System Parameter

System Quantity	1	
Refrigerant Type	PURON	
Compressor Quantity	2	
Compressor Type	Scroll	
Std Capacity Steps	50, 100	
Std Min Outdoor Temp(Cooling)	35.0	°F
No of Outdoor fans	4	

Outdoor Unit Dimensions and Weight

Unit Length	7' 2.1"	
Unit Width	5' 7.1"	
Unit Height	4' 2.4"	
Unit Shipping Weight	978	lb
Unit Operating Weight	978	lb

Warranty Information Outdoor (Note: for US & Canada only)
First Year - Parts Only (Standard)

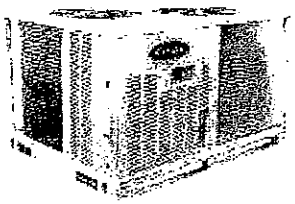
NOTE: Please see Warranty Catalog 808-218 for explanation of policies and ordering methods.

Ordering Information

Part Number	Description	Quantity
Base Unit - Outdoor		
38AUDA25A0E5-0A0A0		
	Base Unit	1
	Cu/Cu Condensing Coil	
	Standard Refrigerant Options	1
	Service Options - None	1
	Electrical Options - None	1
	Packaging Options - Standard	1
	Standard Electrical Mechanical Controls	1
	Refrig Circ/Compressor Staging - Two Circuits/ Dual Stage	1
Accessories		
EF680035	Liquid Line Solenoid Valve for Outdoor Unit	2
EF680037	Liquid Line Solenoid Valve for Outdoor Unit	2

EXHIBIT 5-5

5-5



Outdoor Unit Parameters

Unit Quantity	1	
Unit Model	38AUD	
Unit Size:	20 Tons	
Voltage	208-3-60	V-Ph-Hz
Condenser Coil	Cu/Cu	
No. of Stages	Dual Stage	

System Parameter

System Quantity	1	
Refrigerant Type	PURON	
Compressor Quantity	2	
Compressor Type	Scroll	
Std Capacity Steps	50, 100	
Std Min Outdoor Temp(Cooling)	35.0	°F
No. of Outdoor fans	4	

Outdoor Unit Dimensions and Weight

Unit Length	7' 2.1"	
Unit Width	5' 7.1"	
Unit Height	4' 2.4"	
Unit Shipping Weight	978	lb
Unit Operating Weight	978	lb

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

First Year - Parts Only (Standard)

NOTE: Please see Warranty Catalog 808-218 for explanation of policies and ordering methods.

Ordering Information

Part Number	Description	Quantity
Base Unit - Outdoor		
38AUDA25A0E5-0A0A0		
	Base Unit	1
	Cu/Cu Condensing Coil	
	Standard Refrigerant Options	1
	Service Options - None	1
	Electrical Options - None	1
	Packaging Options - Standard	1
	Standard Electrical Mechanical Controls	1
	Refrig Circ/Compressor Staging - Two Circuits/ Dual Stage	1
Accessories		1
EF680035	Liquid Line Solenoid Valve for Outdoor Unit	
EF680037	Liquid Line Solenoid Valve for Outdoor Unit	2
		2

Exhibit I

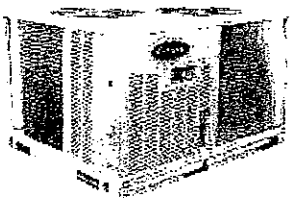
EXHIBIT 5-6

5-6

Unit Report For LECTURE HALL AUDITORIUM 112321

Project: HA-1702-21-11 UOG IFB B21-17 PURCHASING HVAC EQUIP
Prepared By: BERNARD LLARENAS

02:16PM



Outdoor Unit Parameters

Unit Quantity	1	
Unit Model	38AUD	
Unit Size	20 Tons	
Voltage	208-3-60	V-Ph-Hz
Condenser Coil	Cu/Cu	
No. of Stages	Dual Stage	

System Parameter

System Quantity	1	
Refrigerant Type	PURON	
Compressor Quantity	2	
Compressor Type	Scroll	
Std. Capacity Steps	50, 100	
Std. Min. Outdoor Temp(Cooling)	35.0	F
No. of Outdoor fans	4	

Outdoor Unit Dimensions and Weight

Unit Length	7' 2.1"	
Unit Width	5' 7.1"	
Unit Height	4' 2.4"	
Unit Shipping Weight	978	lb
Unit Operating Weight	978	lb

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

First Year - Parts Only (Standard)

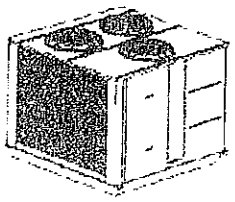
NOTE: Please see Warranty Catalog 808-218 for explanation of policies and ordering methods.

Ordering Information

Part Number	Description	Quantity
Base Unit - Outdoor		
38AUDA25A0E5-0A0A0		
	Base Unit	1
	Cu/Cu Condensing Coil	
	Standard Refrigerant Options	1
	Service Options - None	1
	Electrical Options - None	1
	Packaging Options - Standard	1
	Standard Electrical Mechanical Controls	1
	Refrig Circ/Compressor Staging - Two Circuits/ Dual Stage	1
Accessories		
EF680035	Liquid Line Solenoid Valve for Outdoor Unit	2
EF680037	Liquid Line Solenoid Valve for Outdoor Unit	2

Exhibit J

EXHIBIT 6



Outdoor Unit Parameters

Unit Quantity:	1	
Unit Model:	38APD	
Unit Size:	50 Tons	
Voltage:	208-3-60	V-Ph-Hz
No. of Circuits:	Two Circuits	

System Parameter

System Quantity:	1	
Refrigerant Type:	PURON	
Compressor Quantity:	2 (Circ A), 2 (Circ B)	
Compressor Type:	Scroll	
Std Capacity Steps:	23, 50, 73, 100	
Std. Min. Outdoor Temp(Cooling):	25.0	°F
No. of Outdoor fans:	3	

Outdoor Unit Dimensions and Weight

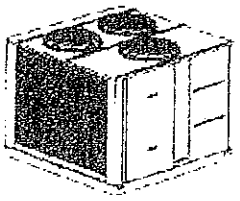
Unit Length:	7' 8.1"	
Unit Width:	7' 4.2"	
Unit Height:	6' 1.0"	
Unit Operating Weight:	2120	lb

Warranty Information Outdoor (Note: for US & Canada only)
First Year - Parts Only (Standard)

NOTE: Please see Warranty Catalog 808-218 for explanation of policies and ordering methods.

Ordering Information

Part Number	Description	Quantity
Base Unit - Outdoor		
38APD05056-3009J		
	Base Unit	1
	Standard Line Length, RTPF	
	Single Point Power, Terminal Block	1
	Export packaging, (Skid + Bag)	1
	Scrolling Marquee, EMM, BACnet Communication	1
	Copper E-Coat Fin / Copper Tube	1
Accessories		1
33CS2PP2S-03	Thermostat for Outdoor Unit	
30GT-911---062	Navigator for Outdoor Unit	1
		1



Outdoor Unit Parameters

Unit Quantity	1	
Unit Model	38APD	
Unit Size	40 Tons	
Voltage	208-3-60	V-Ph-Hz
No. of Circuits	Two Circuits	

System Parameter

System Quantity	1	
Refrigerant Type	PURON	
Compressor Quantity	2 (Circ A), 2 (Circ B)	
Compressor Type	Scroll	
Std. Capacity Steps	23, 50, 73, 100	
Std. Min. Outdoor Temp(Cooling)	32.0	°F
No. of Outdoor fans	3	

Outdoor Unit Dimensions and Weight

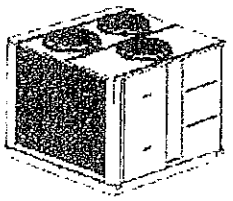
Unit Length	7' 8.1"	
Unit Width	7' 4.2"	
Unit Height	6' 1.0"	
Unit Operating Weight	2094	lb

Warranty Information Outdoor (Note: for US & Canada only)
First Year - Parts Only (Standard)

NOTE: Please see Warranty Catalog 808-218 for explanation of policies and ordering methods.

Ordering Information

Part Number	Description	Quantity
Base Unit - Outdoor		
38APD04056-3009J		
	Base Unit	1
	Standard Line Length, RTPF	
	Single Point Power, Terminal Block	1
	Export packaging, (Skid + Bag)	1
	Scrolling Marquee, EMM, BACnet Communication	1
	Copper E-Coat Fin / Copper Tube	1
		1
Accessories		
30GT-911---062	Navigator for Outdoor Unit	1
33CS2PP2S-03	Thermostat for Outdoor Unit	1



Outdoor Unit Parameters

Unit Quantity	1	
Unit Model	38APD	
Unit Size	40 Tons	
Voltage	208-3-60	V-Ph-Hz
No. of Circuits	Two Circuits	

System Parameter

System Quantity	1	
Refrigerant Type	PURON	
Compressor Quantity	2 (Circ A), 2 (Circ B)	
Compressor Type	Scroll	
Std. Capacity Steps	23, 50, 73, 100	
Std. Min. Outdoor Temp(Cooling)	32.0	°F
No. of Outdoor fans	3	

Outdoor Unit Dimensions and Weight

Unit Length	7' 8.1"	
Unit Width	7' 4.2"	
Unit Height	6' 1.0"	
Unit Operating Weight	2094	lb

Warranty Information Outdoor (Note: for US & Canada only)
First Year - Parts Only (Standard)

NOTE: Please see Warranty Catalog 808-218 for explanation of policies and ordering methods.

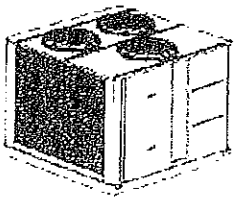
Ordering Information

Part Number	Description	Quantity
Base Unit - Outdoor		
38APD04056-3O09J		
	Base Unit	1
	Standard Line Length, RTPF	
	Single Point Power, Terminal Block	1
	Export packaging, (Skid + Bag)	1
	Scrolling Marquee, EMM, BACnet Communication	1
	Copper E-Coat Fin / Copper Tube	1
Accessories		1
30GT-911---062	Navigator for Outdoor Unit	
33CS2PP2S-03	Thermostat for Outdoor Unit	1
		1

Unit Report For 20SCIENCE BUILDING SECOND FLOOR 112221

Project: HA-1702-21-11 UOG IFB B21-17 PURCHASING HVAC EQUIP
Prepared By: BERNARD LLARENAS

02:16PM



Outdoor Unit Parameters

Unit Quantity	1	
Unit Model	38APD	
Unit Size:	40 Tons	
Voltage:	208-3-60	V-Ph-Hz
No. of Circuits	Two Circuits	

System Parameter

System Quantity:	1	
Refrigerant Type:	PURON	
Compressor Quantity	2 (Circ A), 2 (Circ B)	
Compressor Type	Scroll	
Std. Capacity Steps	23, 50, 73, 100	
Std. Min. Outdoor Temp(Cooling)	32.0	°F
No. of Outdoor fans:	3	

Outdoor Unit Dimensions and Weight

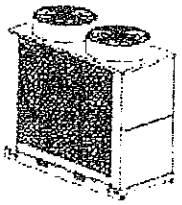
Unit Length	7' 8.1"	
Unit Width	7' 4.2"	
Unit Height	6' 1.0"	
Unit Operating Weight	2094	lb

Warranty Information Outdoor (Note: for US & Canada only)
First Year - Parts Only (Standard)

NOTE: Please see Warranty Catalog 808-218 for explanation of policies and ordering methods.

Ordering Information

Part Number	Description	Quantity
Base Unit - Outdoor		
38APD04056-3009J		
		1
	Base Unit	
	Standard Line Length, RTPF	1
	Single Point Power, Terminal Block	1
	Export packaging, (Skid + Bag)	1
	Scrolling Marquee, EMM, BACnet Communication	1
	Copper E-Coat Fin / Copper Tube	1
Accessories		
30GT-911---062	Navigator for Outdoor Unit	1
33CS2PP2S-03	Thermostat for Outdoor Unit	1



Outdoor Unit Parameters

Unit Quantity:	1	
Unit Model:	38APD	
Unit Size:	30 Tons	
Voltage:	208-3-60	V-Ph-Hz
No. of Circuits:	Two Circuits	

System Parameter

System Quantity:	1	
Refrigerant Type:	PURON	
Compressor Quantity:	1 (Circ A), 1 (Circ B)	
Compressor Type:	Scroll	
Std. Capacity Steps:	50, 100	
Std. Min. Outdoor Temp(Cooling):	32.0	°F
No. of Outdoor fans:	2	

Outdoor Unit Dimensions and Weight

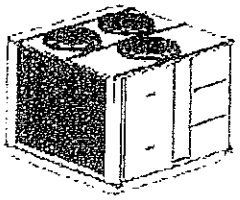
Unit Length:	7' 4.2"	
Unit Width:	3' 4.3"	
Unit Height:	6' 1.1"	
Unit Operating Weight:	1264	lb

Warranty Information Outdoor (Note: for US & Canada only)
First Year - Parts Only (Standard)

NOTE: Please see Warranty Catalog 808-218 for explanation of policies and ordering methods.

Ordering Information

Part Number	Description	Quantity
Base Unit - Outdoor		
38APD03056-3009J		
	Base Unit	1
	Standard Line Length, RTPF	
	Single Point Power, Terminal Block	1
	Export packaging, (Skid + Bag)	1
	Scrolling Marquee, EMM, BACnet Communication	1
	Copper E-Coat Fin / Copper Tube	1
Accessories		1
30GT-911---062	Navigator for Outdoor Unit	
33CS2PP2S-03	Thermostat for Outdoor Unit	1
		1



Outdoor Unit Parameters

Unit Quantity	1	
Unit Model	38APD	
Unit Size	50 Tons	
Voltage	208-3-60	V-Ph-Hz
No. of Circuits	Two Circuits	

System Parameter

System Quantity	1	
Refrigerant Type	PURON	
Compressor Quantity	2 (Circ A), 2 (Circ B)	
Compressor Type	Scroll	
Std Capacity Steps	23, 50, 73, 100	
Std Min. Outdoor Temp(Cooling)	25.0	°F
No. of Outdoor fans	3	

Outdoor Unit Dimensions and Weight

Unit Length	7' 8.1"	
Unit Width	7' 4.2"	
Unit Height	6' 1.0"	
Unit Operating Weight	2120	lb

Warranty Information Outdoor (Note: for US & Canada only)
First Year - Parts Only (Standard)

NOTE: Please see Warranty Catalog 808-218 for explanation of policies and ordering methods.

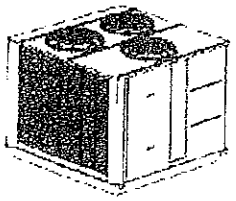
Ordering Information

Part Number	Description	Quantity
Base Unit - Outdoor		
38APD05056-3009J		
	Base Unit	1
	Standard Line Length, RTPF	1
	Single Point Power, Terminal Block	1
	Export packaging, (Skid + Bag)	1
	Scrolling Marquee, EMM, BACnet Communication	1
	Copper E-Coat Fin / Copper Tube	1
Accessories		
33CS2PP2S-03	Thermostat for Outdoor Unit	1
30GT-911---062	Navigator for Outdoor Unit	1

Unit Report For HSS BUILDING 50T 112221

Project: HA-1702-21-11 UOG IFB B21-17 PURCHASING HVAC EQUIP
Prepared By: BERNARD LLARENAS

02:16PM



Outdoor Unit Parameters

Unit Quantity	1	
Unit Model	38APD	
Unit Size	50 Tons	
Voltage	208-3-60	V-Ph-Hz
No. of Circuits	Two Circuits	

System Parameter

System Quantity	1	
Refrigerant Type	PURON	
Compressor Quantity	2 (Circ A), 2 (Circ B)	
Compressor Type	Scroll	
Std. Capacity Steps	23, 50, 73, 100	
Std. Min. Outdoor Temp(Cooling)	25.0	°F
No. of Outdoor fans	3	

Outdoor Unit Dimensions and Weight

Unit Length	7' 8.1"	
Unit Width	7' 4.2"	
Unit Height	6' 1.0"	
Unit Operating Weight	2120	lb

Warranty Information Outdoor (Note: for US & Canada only)
First Year - Parts Only (Standard)

NOTE: Please see Warranty Catalog 808-218 for explanation of policies and ordering methods.

Ordering Information

Part Number	Description	Quantity
Base Unit - Outdoor		
38APD05056-3009J		
	Base Unit	1
	Standard Line Length, RTPF	
	Single Point Power, Terminal Block	1
	Export packaging, (Skid + Bag)	1
	Scrolling Marquee, EMM, BACnet Communication	1
	Copper E-Coat Fin / Copper Tube	1
Accessories		1
33CS2PP2S-03	Thermostat for Outdoor Unit	
30GT-911---062	Navigator for Outdoor Unit	1
		1

EXHIBIT 7

TECHNICAL REPORT

Project name	OOG condensers				
Submitted by	Leo				
Customer	JWS			Date	11/22/2021
OVERVIEW				Quantity	1
System Type	Air-Cooled Split		Refrigerant		R410A
Series	ACCS		Power supply		460V/3/60HZ
Unit nomenclature	6ACCS700-QG + 6EB700D-QG				
Altitude	0 ft		Approval		
FILTER					
Type	Filter 1" 70% Eff				
Size (Qty)	20x25x1(3), 25x25x1(6)				
DX COOLING COIL					
Type	Ø1/2		Number of coil		1
Rows	4		Face area		34.03 ft²
Fins per inch	10		Face velocity		505 ft/min
Refrigerant	R410A		Entering air (DB)		80 °F
Capacity (Total)	640800 Btu/h		Entering air (WB)		67 °F
Capacity (Sensible)	442555 Btu/h		Leaving air (DB)		55.9 °F
Air pressure drop	0.6 inH2O		Leaving air (WB)		54.7 °F
COMPRESSOR (OR EQUIVALENT MODELS)					
Compressor					2 X ZP154 TDM
Type	Scroll, Fixed Speed		Quantity		4
Total LRA	600.0 A		Total Power		49.8 kW
			Total Amps		74.9 A
FAN (EVAPORATOR)					
Type	Belt Driven		Model		560
Air Flow	17200 CFM		Fan Speed		630 RPM
External Static Pressure	0.5 inH2O		Absorbed Power		7.2 kW
Total Static Pressure	1.5 inH2O		Motor Horsepower		15 HP
Quantity	1		FLA		19.9 A
			Locked rotor current (LRA)		129.1 A
CONDENSER (AIR COOLED)					
Model	Ø3/8		Motor HP (each)		2 2/3 HP
Quantity	1		FLA (each)		4 A
Condenser Fan Motor	800MM		Ambient Temperature		95 °F
Quantity	3				
ELECTRICAL SUMMARY					
Unit FLA	106.8 A		MCA		111.5 A
Total Power Input	63.68 kW		MFS		150 A
EER	10.06		IEER		n/a
OPTIONS					
DESCRIPTION					
SV: Suction/Discharge/Liquid Line Service Valves					
CU-C: Condenser Coil Fin Materials - Copper					
CG: Condenser Coil Guard					
DOL2: IEC DOL (Non UL)					
MII: Door Interlock Main Incoming Isolator					
PFR: UVR/Phase Failure Protect					
IR33. Controller - IR33					
NOTES					
Manufacturer reserves the right to change specifications without prior notice.					

Exhibit K

TECHNICAL REPORT

Project name	OOG condensers				
Submitted by	Leo				
Customer	JWS			Date	11/22/2021
OVERVIEW				Quantity	1
System Type	Air-Cooled Split	Refrigerant		R410A	
Series	ACCS	Power supply		208V/3/60HZ	
Unit nomenclature	6ACCS220-QG + 6HE8220D-QG				
Altitude	0 ft	Approval			
FILTER					
Type	Filter 1" 70% Eff				
Size (Qty)	25x20x1(1), 25x25x1(2)				
DX COOLING COIL					
Type	Ø3/8	Number of coil		1	
Rows	3	Face area		13.22	ft²
Fins per inch	12	Face velocity		408	ft/min
Refrigerant	R410A	Entering air (DB)		80	°F
Capacity (Total)	190397 Btu/h	Entering air (WB)		67	°F
Capacity (Sensible)	134438 Btu/h	Leaving air (DB)		56.8	°F
Air pressure drop	0.3 inH2O	Leaving air (WB)		55.4	°F
COMPRESSOR (OR EQUIVALENT MODELS)					
Compressor					
Type	Scroll, Fixed Speed	Quantity		ZP182	
Total LRA	340.0 A	Total Power		1	
		Total Amps		15.7	kW
FAN (EVAPORATOR)				51	A
Type	Belt Driven	Model			
Air Flow	5400 CFM	Fan Speed		1S/15	
External Static Pressure	0.5 inH2O	Absorbed Power		772	RPM
Total Static Pressure	1.2 inH2O	Motor Horsepower		1.6	kW
Quantity	1	FLA		3	HP
		Locked rotor current (LRA)		10.3	A
CONDENSER (AIR COOLED)				64	A
Model	Ø3/8	Motor HP (each)			
Quantity	1	FLA (each)		1	HP
Condenser Fan Motor	26" (660MM)	Ambient Temperature		2.9	A
Quantity	2			95	°F
ELECTRICAL SUMMARY					
Unit FLA	67.1 A	MCA		79.9	A
Total Power Input	18.89 kW	MFS		150	A
EER	10.08	IEER		n/a	
OPTIONS					

DESCRIPTION

SV: Suction/Discharge/Liquid Line Service Valves
CU-C: Condenser Coil Fin Materials - Copper
CG: Condenser Coil Guard
DOL2: IEC DOL (Non UL)
MII: Door Interlock Main Incoming Isolator
PFR: UVR/Phase Failure Protect
IR33: Controller - IR33

NOTES

Manufacturer reserves the right to change specifications without prior notice.

TECHNICAL REPORT

Project name	OOG condensers				
Submitted by	Leo				
Customer	JWS			Date	11/22/2021
OVERVIEW				Quantity	1
System Type	Air-Cooled Split		Refrigerant		R410A
Series	ACCS		Power supply		460V/3/60HZ
Unit nomenclature	6ACCS290-QG + 6EB290D-QG				
Altitude	0	ft	Approval		
FILTER					
Type	Filter 1" 70% Eff				
Size (Qty)	25x16x1(3), 25x20x1(3)				
DX COOLING COIL					
Type	Ø3/8		Number of coil	1	
Rows	3		Face area	16.53	ft²
Fins per inch	12		Face velocity	454	ft/min
Refrigerant	R410A		Entering air (DB)	80	°F
Capacity (Total)	253522	Btu/h	Entering air (WB)	67	°F
Capacity (Sensible)	181867	Btu/h	Leaving air (DB)	57.4	°F
Air pressure drop	0.4	inH2O	Leaving air (WB)	55.9	°F
COMPRESSOR (OR EQUIVALENT MODELS)					
Compressor					
Type	Scroll, Fixed Speed		Quantity	2 X ZP122	
Total LRA	280.0	A	Total Power	2	
			Total Amps	22.5	kW
FAN (EVAPORATOR)				34.3	A
Type	Belt Driven		Model		
Air Flow	7500	CFM	Fan Speed	18/13	
External Static Pressure	0.5	inH2O	Absorbed Power	693	RPM
Total Static Pressure	1.3	inH2O	Motor Horsepower	2.9	kW
Quantity	1		FLA	5.5	HP
			Locked rotor current (LRA)	8.2	A
CONDENSER (AIR COOLED)				50.5	A
Model	Ø3/8		Motor HP (each)	1	HP
Quantity	1		FLA (each)	1.6	A
Condenser Fan Motor	26" (660MM)		Ambient Temperature	95	°F
Quantity	2				
ELECTRICAL SUMMARY					
Unit FLA	45.7	A	MCA	50	A
Total Power Input	27.04	kW	MFS	70	A
EER	9.38		IEER	n/a	
OPTIONS					

DESCRIPTION

SV: Suction/Discharge/Liquid Line Service Valves
CU-C: Condenser Coil Fin Materials - Copper
CG: Condenser Coil Guard
OOL2: IEC DOL (Non UL)
MII: Door Interlock Main Incoming Isolator
PFR: UVR/Phase Failure Protect
IR33: Controller - IR33

NOTES

Manufacturer reserves the right to change specifications without prior notice.

TECHNICAL REPORT

Project name	OOG condensers				
Submitted by	Leo				
Customer	JWS			Date	11/22/2021
OVERVIEW				Quantity	1
System Type	Air-Cooled Split	Refrigerant		R410A	
Series	ACCS	Power supply		460V/3/60HZ	
Unit nomenclature	6ACCS435-QG + 6EB435D-QG				
Altitude	0 ft	Approval			
FILTER					
Type	Filter 1" 70% Eff				
Size (Qty)	20x25x1(3), 25x25x1(3)				
DX COOLING COIL					
Type	Ø3/8	Number of coil		1	
Rows	3	Face area		21.39	ft²
Fins per inch	13	Face velocity		538	ft/min
Refrigerant	R410A	Entering air (DB)		80	°F
Capacity (Total)	377724 Btu/h	Entering air (WB)		67	°F
Capacity (Sensible)	274677 Btu/h	Leaving air (DB)		57.7	°F
Air pressure drop	0.5 inH2O	Leaving air (WB)		56.3	°F
COMPRESSOR (OR EQUIVALENT MODELS)					
Compressor					
Type	Scroll, Fixed Speed	Quantity		2 X ZP182	
Total LRA	358.0 A	Total Power		2	
		Total Amps		31.2	kW
FAN (EVAPORATOR)				50.6	A
Type	Belt Driven	Model			
Air Flow	11500 CFM	Fan Speed		450	
External Static Pressure	0.5 inH2O	Absorbed Power		763	RPM
Total Static Pressure	1.4 inH2O	Motor Horsepower		5.4	kW
Quantity	1	FLA		10	HP
		Locked rotor current (LRA)		14.4	A
CONDENSER (AIR COOLED)				85.7	A
Model	Ø3/8	Motor HP (each)			
Quantity	1	FLA (each)		1	HP
Condenser Fan Motor	26" (660MM)	Ambient Temperature		1.6	A
Quantity	3			95	°F
ELECTRICAL SUMMARY					
Unit FLA	69.8 A	MCA		76.1	A
Total Power Input	39.02 kW	MFS		125	A
EER	9.68	IEER		n/a	

OPTIONS

DESCRIPTION
SV: Suction/Discharge/Liquid Line Service Valves
CU-C: Condenser Coil Fin Materials - Copper
CG: Condenser Coil Guard
DOL2: IEC DOL (Non UL)
MII: Door Interlock Main Incoming Isolator
PFR: UVR/Phase Failure Protect
IR33: Controller - IR33

NOTES

Manufacturer reserves the right to change specifications without prior notice.

TECHNICAL REPORT

Project name	OOG condensers				
Submitted by	Leo				
Customer	JWS			Date	11/22/2021
OVERVIEW				Quantity	1
System Type	Air-Cooled Split	Refrigerant		R410A	
Series	ACCS	Power supply		208V/3/60HZ	
Unit nomenclature	6ACCS290-QG + 6EB290D-QG				
Altitude	0 ft	Approval			
FILTER					
Type	Filter 1" 70% Eff				
Size (Qty)	25x16x1(3), 25x20x1(3)				
DX COOLING COIL					
Type	Ø3/8	Number of coil		1	
Rows	3	Face area		16.53	ft²
Fins per inch	12	Face velocity		454	ft/min
Refrigerant	R410A	Entering air (DB)		80	°F
Capacity (Total)	249769 Btu/h	Entering air (WB)		67	°F
Capacity (Sensible)	180502 Btu/h	Leaving air (DB)		57.6	°F
Air pressure drop	0.4 inH2O	Leaving air (WB)		56.1	°F
COMPRESSOR (OR EQUIVALENT MODELS)					
Compressor					
Type	Scroll, Fixed Speed	Quantity		2 X ZP122	
Total LRA	480.0 A	Total Power		2	
		Total Amps		22.9	kW
FAN (EVAPORATOR)				63.7	A
Type	Belt Driven	Model			
Air Flow	7500 CFM	Fan Speed		18/13	
External Static Pressure	0.5 inH2O	Absorbed Power		693	RPM
Total Static Pressure	1.3 inH2O	Motor Horsepower		2.9	kW
Quantity	1	FLA		5.5	HP
		Locked rotor current (LRA)		18.1	A
CONDENSER (AIR COOLED)				112	A
Model	Ø3/8	Motor HP (each)			
Quantity	1	FLA (each)		1	HP
Condenser Fan Motor	26" (660MM)	Ambient Temperature		2.9	A
Quantity	2			95	°F
ELECTRICAL SUMMARY					
Unit FLA	87.6 A	MCA			
Total Power Input	27.3 kW	MFS		95.5	A
EER	9.15	IEER		150	A
OPTIONS				n/a	

DESCRIPTION

SV: Suction/Discharge/Liquid Line Service Valves
CU-C: Condenser Coil Fin Materials - Copper
SSD: Stainless Steel Drain Pan
CG: Condenser Coil Guard
DOL2: IEC DOL (Non UL)
MII: Door Interlock Main Incoming Isolator
PFR: UVR/Phase Failure Protect
IR33: Controller - IR33

NOTES

Manufacturer reserves the right to change specifications without prior notice.

TECHNICAL REPORT

Project name	OOG condensers				
Submitted by	Leo				
Customer	JWS			Date	11/22/2021
OVERVIEW				Quantity	1
System Type	Air-Cooled Split		Refrigerant		R410A
Series	ACCS		Power supply		208V/3/60HZ
Unit nomenclature	6ACCS43S-QG + 6EB43SD-QG				
Altitude	0 ft		Approval		
FILTER					
Type	Filter 1" 70% Eff				
Size (Qty)	20x25x1(3), 25x25x1(3)				
DX COOLING COIL					
Type	Ø3/8		Number of coil		1
Rows	3		Face area		21.39 ft²
Fins per inch	13		Face velocity		538 ft/min
Refrigerant	R410A		Entering air (DB)		80 °F
Capacity (Total)	376700 Btu/h		Entering air (WB)		67 °F
Capacity (Sensible)	273995 Btu/h		Leaving air (DB)		57.7 °F
Air pressure drop	0.5 inH2O		Leaving air (WB)		56.3 °F
COMPRESSOR (OR EQUIVALENT MODELS)					
Compressor					
Type	Scroll, Fixed Speed		Quantity		2 X ZP182
Total LRA	680.0 A		Total Power		2
			Total Amps		32.1 kW
FAN (EVAPORATOR)					103.6 A
Type	Belt Driven		Model		
Air Flow	11500 CFM		Fan Speed		450
External Static Pressure	0.5 inH2O		Absorbed Power		762 RPM
Total Static Pressure	1.4 inH2O		Motor Horsepower		5.4 kW
Quantity	1		FLA		10 HP
CONDENSER (AIR COOLED)			Locked rotor current (LRA)		31.8 A
Model					190.1 A
Quantity	Ø3/8		Motor HP (each)		
Condenser Fan Motor	1		FLA (each)		1 HP
Quantity	26" (660MM)		Ambient Temperature		2.9 A
ELECTRICAL SUMMARY	3				95 °F
Unit FLA					
Total Power Input	144.1 A		MCA		157 A
EER	39.8 kW		MFS		225 A
OPTIONS	9.47		IEER		n/a
DESCRIPTION					
SV: Suction/Discharge/Liquid Line Service Valves					
CU-C: Condenser Coil Fin Materials - Copper					
CG: Condenser Coil Guard					
DOL2: IEC DOL (Non UL)					
MII: Door Interlock Main Incoming Isolator					
PFR: UVR/Phase Failure Protect					
IR33: Controller - IR33					
NOTES					
Manufacturer reserves the right to change specifications without prior notice.					

TECHNICAL REPORT

Project name	OOG condensers				
Submitted by	Leo				
Customer	JWS			Date	11/22/2021
OVERVIEW				Quantity	1
System Type	Air-Cooled Split	Refrigerant		R410A	
Series	ACCS	Power supply		208V/3/60HZ	
Unit nomenclature	6ACCS570-QG + 6EB570D-QG				
Altitude	0 ft	Approval			
FILTER					
Type	Filter 1" 70% Eff				
Size (Qty)	20x25x1(9)				
DX COOLING COIL					
Type	Ø3/8	Number of coil		1	
Rows	3	Face area		29.17	ft²
Fins per inch	12	Face velocity		514	ft/min
Refrigerant	R410A	Entering air (DB)		80	°F
Capacity (Total)	497149 Btu/h	Entering air (WB)		67	°F
Capacity (Sensible)	357934 Btu/h	Leaving air (DB)		57.7	°F
Air pressure drop	0.5 inH2O	Leaving air (WB)		56.3	°F
COMPRESSOR (OR EQUIVALENT MODELS)					
Compressor				2 X ZP154 + ZP182	
Type	Scroll, Fixed Speed	Quantity		3	
Total LRA	2x300 1x340 A	Total Power		44.2	kW
		Total Amps		137.4	A
FAN (EVAPORATOR)					
Type	Belt Driven	Model		500	
Air Flow	15000 CFM	Fan Speed		727	RPM
External Static Pressure	0.5 inH2O	Absorbed Power		7.2	kW
Total Static Pressure	1.4 inH2O	Motor Horsepower		15	HP
Quantity	1	FLA		44.2	A
		Locked rotor current (LRA)		286.1	A
CONDENSER (AIR COOLED)					
Model	Ø3/8	Motor HP (each)		1	HP
Quantity	1	FLA (each)		2.9	A
Condenser Fan Motor	26" (660MM)	Ambient Temperature		95	°F
Quantity	4				
ELECTRICAL SUMMARY					
Unit FLA	193.2 A	MCA		206.2	A
Total Power Input	54.42 kW	MFS		300	A
EER	9.14	IEER		n/a	
OPTIONS					

DESCRIPTION

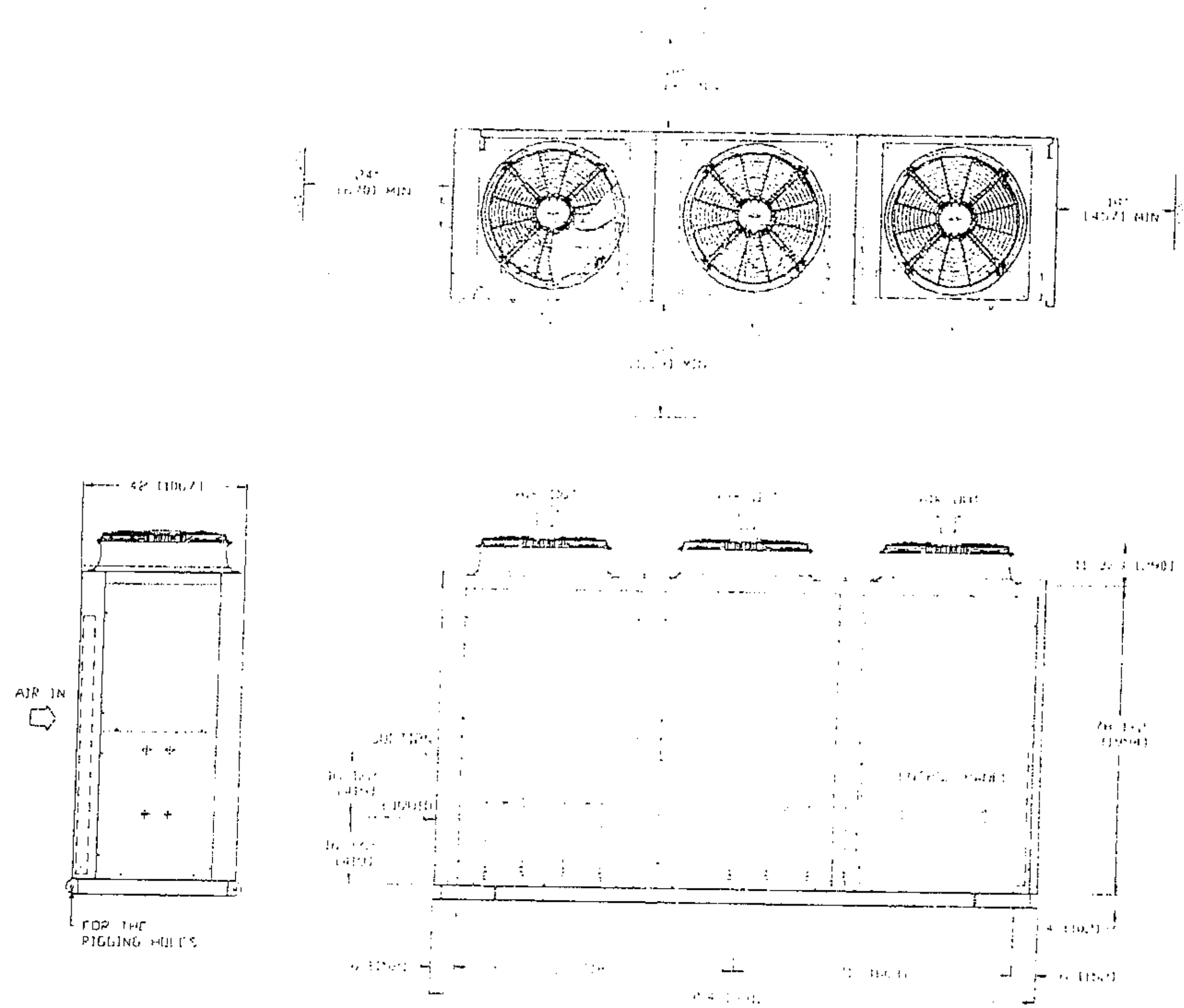
SV: Suction/Discharge/Liquid Line Service Valves
CU-C: Condenser Coil Fin Materials - Copper
CG: Condenser Coil Guard
DOL2: IEC DOL (Non UL)
MII: Door Interlock Main Incoming Isolator
PFR: UVR/Phase Failure Protect
IR33: Controller - IR33

NOTES

Manufacturer reserves the right to change specifications without prior notice.

TECHNICAL REPORT

Project name	OOG condensers					
Submitted by	Leo					
Customer	JWS			Date	11/22/2021	
OVERVIEW				Quantity	1	
System Type	Air-Cooled Split		Refrigerant		R410A	
Series	ACCS		Power supply		208V/3/60HZ	
Unit nomenclature	6ACCS700-QG + 6EB700D-QG					
Altitude	0	ft	Approval			
FILTER						
Type	Filter 1" 70% Eff					
Size (Qty)	20x25x1(3), 25x25x1(6)					
DX COOLING COIL						
Type	Ø1/2		Number of coil	1		
Rows	4		Face area	34.03	ft²	
Fins per inch	10		Face velocity	505	ft/min	
Refrigerant	R410A		Entering air (DB)	80	°F	
Capacity (Total)	639094	Btu/h	Entering air (WB)	67	°F	
Capacity (Sensible)	441872	Btu/h	Leaving air (DB)	56.1	°F	
Air pressure drop	0.6	inH2O	Leaving air (WB)	54.7	°F	
COMPRESSOR (OR EQUIVALENT MODELS)						
Compressor						
Type	Scroll, Fixed Speed		Quantity	2 X ZP154 TDM		
Total LRA	1200.0	A	Total Power	4		
			Total Amps	51.8	kW	
FAN (EVAPORATOR)				161.3	A	
Type	Belt Driven		Model			
Air Flow	17200	CFM	Fan Speed	560		
External Static Pressure	0.5	inH2O	Absorbed Power	630	RPM	
Total Static Pressure	1.5	inH2O	Motor Horsepower	7.2	kW	
Quantity	1		FLA	15	HP	
			Locked rotor current (LRA)	44.2	A	
CONDENSER (AIR COOLED)				286.1	A	
Model	Ø3/8		Motor HP (each)	2 2/3	HP	
Quantity	1		FLA (each)	7.5	A	
Condenser Fan Motor	800MM		Ambient Temperature	95	°F	
Quantity	3					
ELECTRICAL SUMMARY						
Unit FLA	228	A	MCA	238.1	A	
Total Power Input	65.26	kW	MFS	300	A	
EER	9.79		IEER	n/a		
OPTIONS						
DESCRIPTION						
SV: Suction/Discharge/Liquid Line Service Valves						
CU-C: Condenser Coil Fin Materials - Copper						
CG: Condenser Coil Guard						
DOL2 IEC DOL (Non UL)						
MII: Door Interlock Main Incoming Isolator						
PFR: UVR/Phase Failure Protect						
IR33: Controller - IR33						
NOTES						
Manufacturer reserves the right to change specifications without prior notice.						



TGT/ENG/CB/02 REV 7 11/15

CERTIFIED DRAWING

COMP	ZR 160 JDM(2) (R407C) ZP 154 JDM(2) (R410A)
COIL SIZE	ø 3/8×40×68T×144FL×12FPI (SCH)
COND. CIR	4 1/C. (28×28) IN/OUT
SUBCOOL CIR	4 1/C. 6 IN/OUT×(2)
SUCTION ø	1 5/8×(2)
LIQUID ø	7/8×(2)
COND. FAN MTR	2 2/3 HP×(3)
FAN ø	805MM×(3)

CONDENSER WITH SLIT FINS
DOUBLE DOOR CONTROL PANEL
ALL DIMENSIONS ARE IN INCHES (MM)

DRAWN BY	ALYN	DATE	21-09-2012
DESIGNED BY	JOSEPHW	DATE	20/12/2017
CHECKED BY		DATE	
APPROVED BY		DATE	

REV	DESCRIPTION	DATE	DRN BY
1.2	UPDATE MASON DATA	20.12.17	JOSEPH
1.1	CHANGE CONDENSER FAN TYPE REVISE DRAWING	11.10.16	CHP

DUNHAM-BUSH INDUSTRIES SDN BHD

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LOCATION.
QTY.
MODEL 6ACCX 700 P/6
PROJECT STANDARD
TITLE
A/C CONDENSING UNIT
DRAWING NO 32449A-019 REV 1.2
SCALE : N.T.S SHEET 1 OF 1

Exhibit L

TGI/CNG/CD/02 REV. 7 11/15

CERTIFIED DRAWING

COMP	: ZR190 (407C) / ZP182 (410A)
COIL SIZE	: ø 3/8x3Rx48THx62FLx10FPI (SLIT)
COND. CIR.	: 6 1/C, 22 IN/OUT
SUBCOOL CIR.	: 2 1/C, 6 IN/OUT
SUCTION ø	: 1 3/8x(1)
LIQUID ø	: 5/8x(1)
COND. FAN MTR	: 1 HPx(2)
FAN ø	: 650MM. x(2)

CONDENSER WITH SLIT FINS
DOUBLE DOOR CONTROL PANEL
ALL DIMENSIONS ARE IN INCHES (MM)

DRAWN BY ALYN	DATE 19-09-2017
DESIGNED BY JOSEPHW	DATE 20/12/2017
CHECKED BY	DATE
APPROVED BY	DATE

REV	DESCRIPTION	DATE	DRN BY
1.3	UPDATE R410A DATA	08.12.17	JOSEPH
1.2	UPDATE TEXT	15.3.17	N'din
1.1	CHANGE FAN TYPE	6.2.17	N'din

DUNHAM-BUSH INDUSTRIES SDN. BHD

LOCATION.

QTY.

MODEL 6ACCS 220-P/G

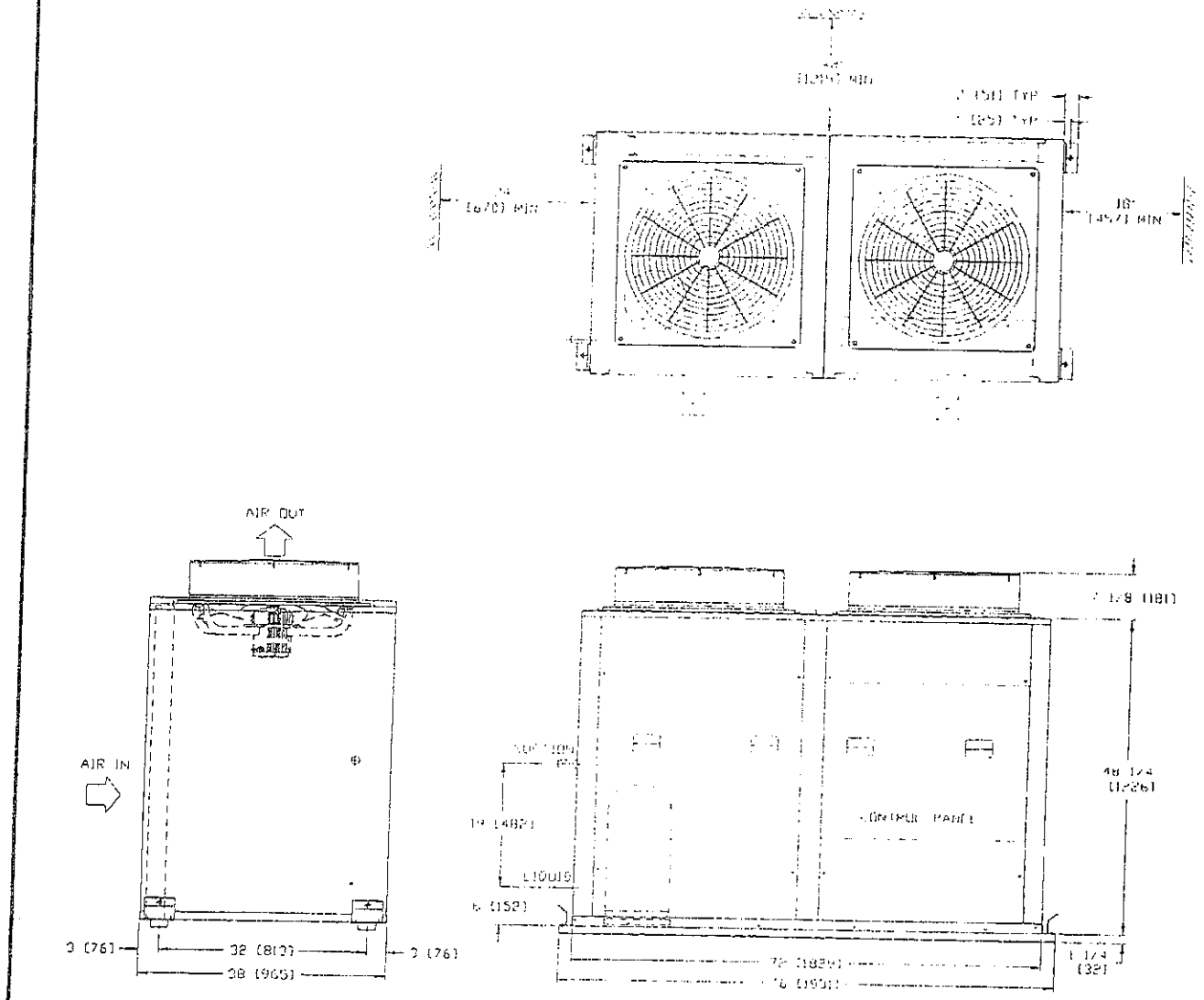
PROJECT STANDARD

TITLE

A/C CONDENSING UNIT

DRAWING NO 82449A--009 REV: 1.3

SCALE : N.T.S SHEET 1 OF 1



TGI/ENG/CD/02 REV 7 15/15

CERTIFIED DRAWING

COMP.	: ZR 125(2) (R407C) / ZP 122(2) (R410A)
COIL SIZE	: ø 3/8x4Rx48THx62FLx10FPi (SLIT)
COND. CIR.	: 8 T/C, 11 IN/OUTx(2)
SUBCOOL CIR	: 2 T/C, 4 IN/OUTx(2)
SUCTION ø	: 1 3/8x(2)
LIQUID ø	: 1/2x(2)
COND. FAN MTR	: 1 HPx(2)
FAN ø	: 650MM, x(2)

CONDENSER WITH SLIT FINS
DOUBLE DOOR CONTROL PANEL
ALL DIMENSIONS ARE IN INCHES (MM)

DRAWN BY	ALYN	DATE	20-09-2012
DESIGNED BY	JOSEPHW	DATE	20/12/2017
CHECKED BY		DATE	
APPROVED BY		DATE	

REV	DESCRIPTION	DATE	DRN BY
1.3	UPDATE R410A DATA	18.12.17	JOSEPH
1.2	UPDATE TEXT	15.3.13	N'din
1.1	CHANGE FAN TYPE	8.2.13	N'din

DUNHAM-BUSH INDUSTRIES SDN. BHD

LOCATION.

QTY.

MODEL DACCS 290-P/G

PROJECT STANDARD

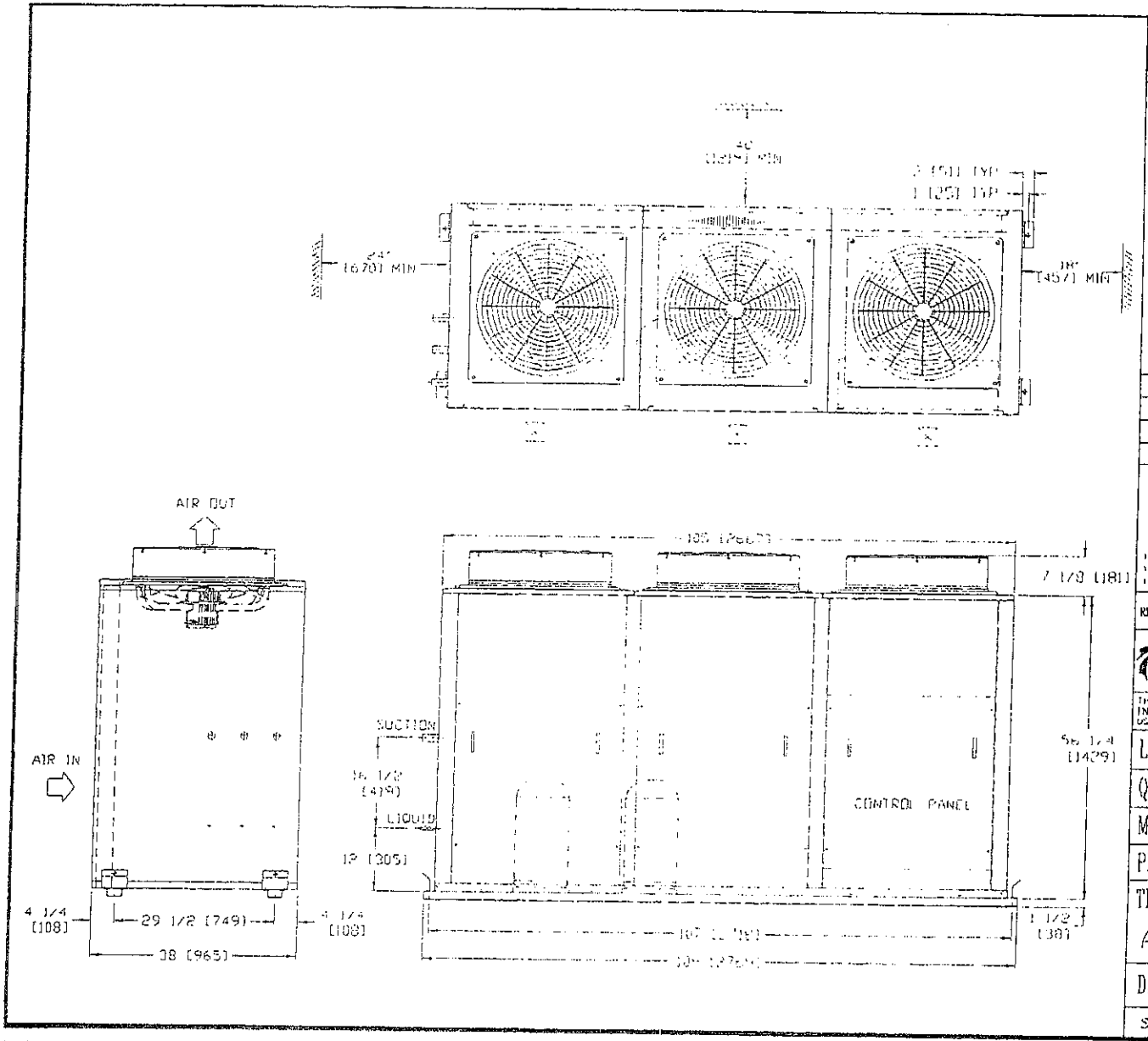
TITLE

A/C CONDENSING UNIT

DRAWING NO 82449A-011 REV: 1.3

SCALE : N.T.S SHEET 1 OF 1

TGI/ENG/CD/02 REV. 7 11/15



CERTIFIED DRAWING

COMP	ZR 190(2) (R407C) / ZP 182(2) (R410A)
COIL SIZE	Ø 3/8x4Rx58TH×98FL×12FPI (SLIT)
COND. CIR	: 4 1/C, (25+26) IN/OUT
SUBCOOL CIR.	: 2 1/C, (5+5) IN/OUT
SUCTION Ø	: 1 3/8x(2)
LIQUID Ø	5/8x(2)
COND. FAN MTR	: 1 HPx(3)
FAN Ø	660MM. x(3)

CONDENSER WITH SLIT FINS
DOUBLE DOOR CONTROL PANEL
ALL DIMENSIONS ARE IN INCHES (MM)

DRAWN BY ALYN	DATE 21-09-2012
DESIGNED BY JOSEPHW	DATE 20/12/2017
CHECKED BY	DATE
APPROVED BY	DATE

REV	DESCRIPTION	DATE	DRN BY
1.3	UPDATE R410A DATA	20.12.17	JOSEPH
1.2	UPDATE TEXT	15.3.12	N'din
1.1	CHANGE FAN TYPE	6.2.12	N'din

DUNHAM-BUSH INDUSTRIES SDN. BHD

LOCATION.

QTY.

MODEL 6ACCS 435-P/G

PROJECT STANDARD

TITLE

A/C CONDENSING UNIT

DRAWING NO 82449A-014 REV: 1.3

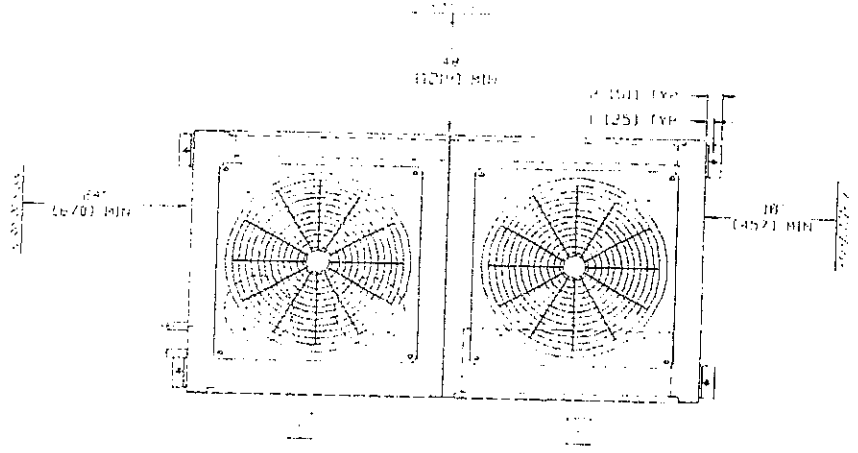
SCALE : N. T. S SHEET 1 OF 1

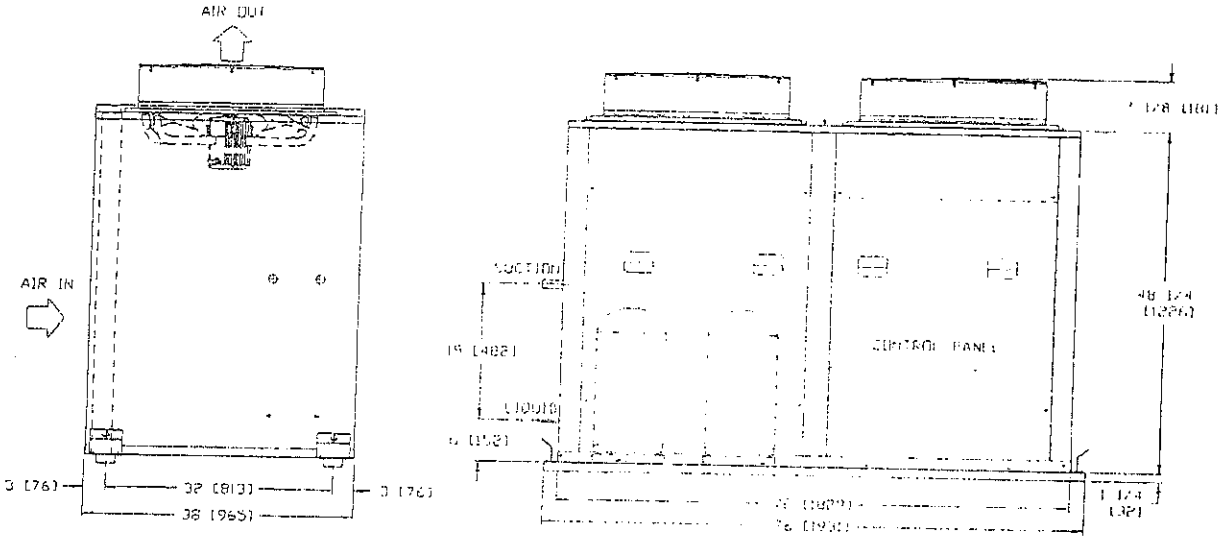
TGI/ENG/CD/02 REV. 7 11/15

CERTIFIED DRAWING

COMP.	: ZR 125(2) (R407C) / ZP 122(2) (R410A)
COIL SIZE	: ø 3/8x4Rx48lHx62FLx10FPI (SLIT)
COND. CIR.	: 8 T/C, 11 IN/OUTx(2)
SUBCOOL CIR	: 2 T/C, 4 IN/OUTx(2)
SUCTION ø	: 1 5/8x(2)
LIQUID ø	: 1/2x(2)
COND FAN MTR	: 1 HPx(2)
FAN ø	: 650MM, x(2)

CONDENSER WITH SLIT FINS
DOUBLE DOOR CONTROL PANEL
ALL DIMENSIONS ARE IN INCHES (MM)





REV	DESCRIPTION	DATE	DRN BY
1.3	UPDATE R410A DATA	20.12.17	JOSEPH
1.2	UPDATE TEXT	15.3.17	N'din
1.1	CHANGE FAN TYPE	15.2.17	N'din

DUNHAM-BUSH INDUSTRIES SDN. BHD

DRAWN BY	ALYN
DATE	20-09-2012
DESIGNED BY	JOSEPHW
DATE	20/12/2017
CHECKED BY	
DATE	
APPROVED BY	
DATE	

LOCATION.

QTY.

MODEL ACCS 290-P/G

PROJECT STANDARD

TITLE

A/C CONDENSING UNIT

DRAWING NO 82449A-011 REV: 1.3

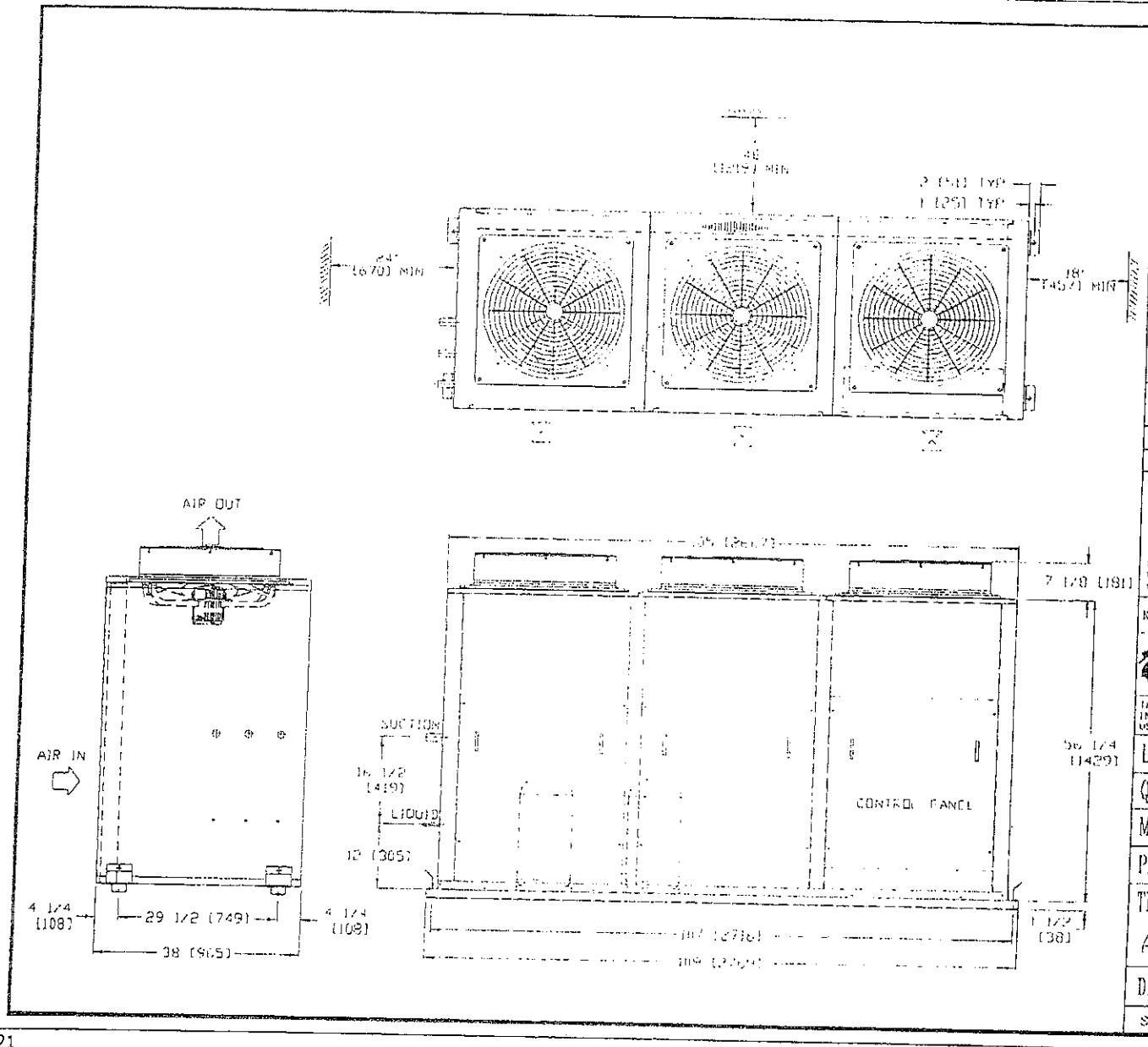
SCALE : N. T. S SHEET 1 OF 1

TG1/ENG/CD/02 REV. 7 11/15

CERTIFIED DRAWING

COMP	: ZR 190(2) (R407C) / ZP 182(2) (R410A)
COIL SIZE	: Ø 5/8x4Rx561Hx968Lx12FPI (SLIT)
COND. CIR	: 4 1/C, (25+26) IN/OUT
SUBCOOL CIR.	: 2 1/C, (5+5) IN/OUT
SUCTION Ø	: 1 3/8x(2)
LIQUID Ø	: 5/8x(2)
COND. FAN MTR	: 1 HPx(3)
FAN Ø	: 660MM. x(3)

CONDENSER WITH SLIT FINS
DOUBLE DOOR CONTROL PANEL
ALL DIMENSIONS ARE IN INCHES (MM)



DRAWN BY ALYN	DATE 21-09-2012	
DESIGNED BY JOSEPHW	DATE 20/12/2017	
CHECKED BY	DATE	
APPROVED BY	DATE	

REV	DESCRIPTION	DATE	DRN BY
1.3	UPDATE R410A DATA	20.12.17	JOSEPH
1.2	UPDATE ICKT	13.3.17	N'dia
1.1	CHANGE FAN TYPE	6.2.17	N'dia

DUNHAM-BUSH INDUSTRIES SDN. BHD

LOCATION.

QTY.

MODEL 6ACCS 435-P/G

PROJECT STANDARD

TITLE

A/C CONDENSING UNIT

DRAWING NO 82449A-014 REV: 1.3

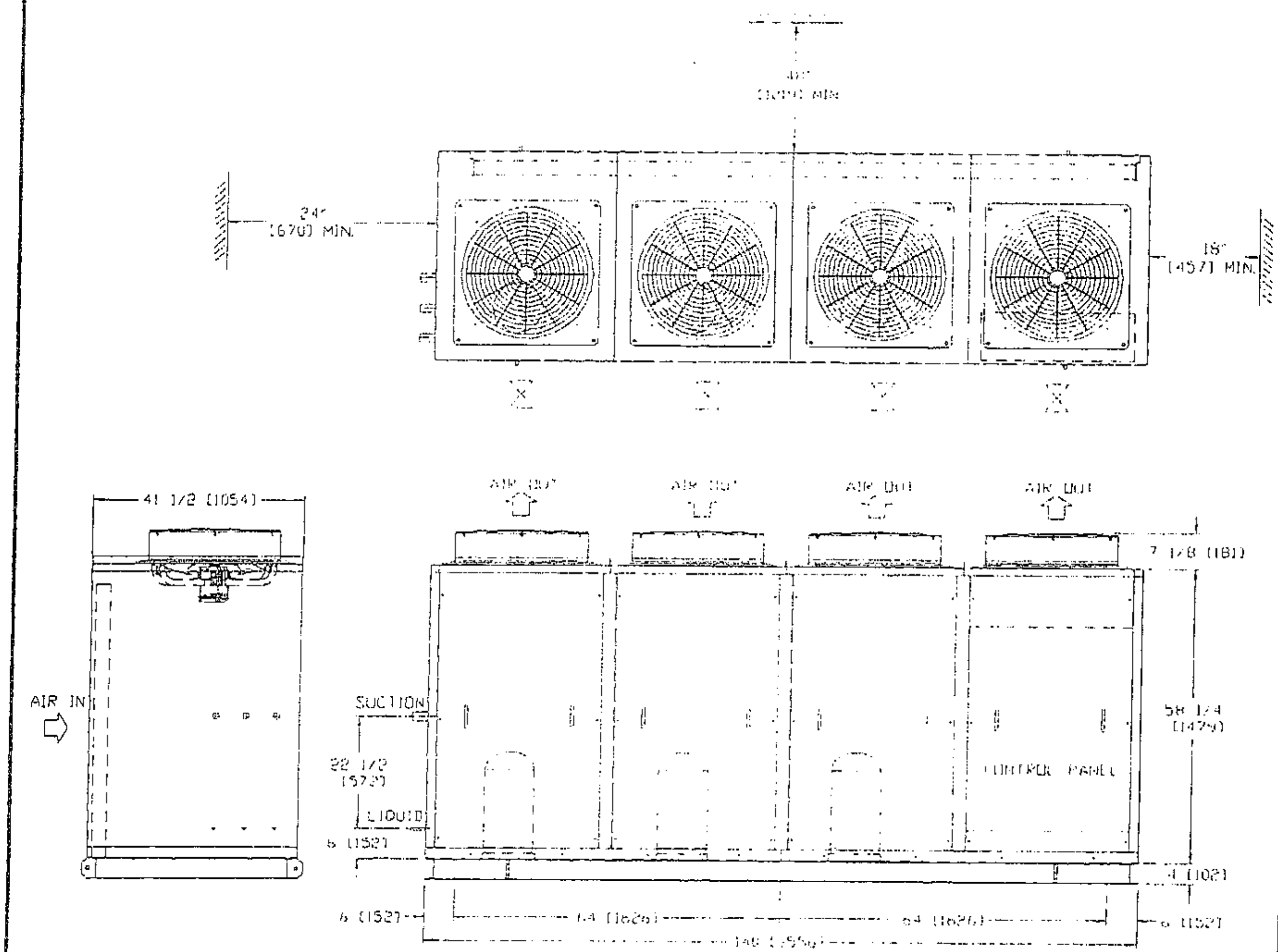
SCALE : N.T.S SHEET 1 OF 1

TGI/ENG/CD/02 REV. 7 11/15

CERTIFIED DRAWING

COMP	ZR190(1) + ZR160(2) (R407C) / ZP182(1) + ZP154(2) (R410A)
COIL SIZE	ø 3/8x4Rx54THx130FLx10FPI (SLIT)
COND. CIR.	4 T/C, 16 IN/OUTx(3)
SUBCOOL CIR.	2 T/C, 4 IN/OUTx(3)
SUCTION ø	1 3/8x(3)
LIQUID ø	5/8x(3)
COND. FAN MTR	1 HPx(4)
FAN ø	660MM. x(4)

CONDENSER WITH SLIT FINS
DOUBLE DOOR CONTROL PANEL
ALL DIMENSIONS ARE IN INCHES (MM)



DRAWN BY	ALVN	DATE	21-09-2012
DESIGNED BY	JOSEPHW	DATE	20/12/2017
CHECKED BY		DATE	
APPROVED BY		DATE	

REV	DESCRIPTION	DATE	DRN BY
1.3	UPDATE R410A DATA		
1.2	UPDATE TEXT	15.3.17	N'din
1.1	CHANGE FAN TYPE	6.2.17	N'din

DUNHAM-BUSH INDUSTRIES SDN. BHD.

LOCATION.

QTY.

MODEL 6ACCS 570-P/G

PROJECT STANDARD

TITLE A/C CONDENSING UNIT

DRAWING NO 82449A-017 REV: 1.3

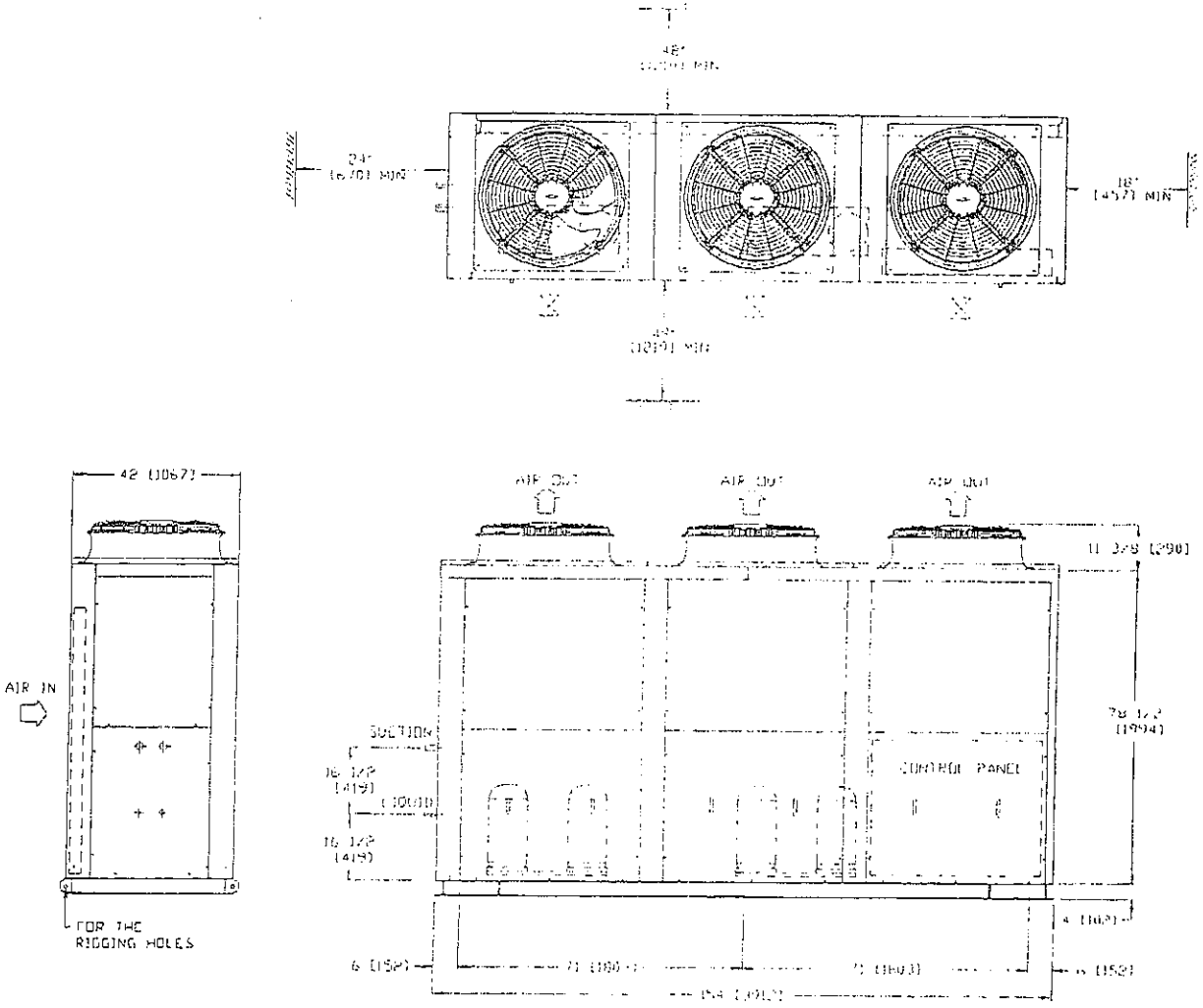
SCALE : N.T.S. SHEET 1 OF 1

TGI/ENG/CD/02 REV 7 17/15

CERTIFIED DRAWING

COMP.	: ZR 160 TDM(2) (R407C) ZP 154 TDM(2) (R410A)
COIL SIZE	: Ø 3/8x4Rx68THx144FLx12FPI (SLIT)
COND CIR	: 4 T/C, (28+28) IN/OUT
SUBCOOL CIR.	: 4 T/C, 6 IN/OUTx(2)
SUCTION ø	: 1 5/8x(2)
LIQUID ø	: 7/8x(2)
COND. FAN MTR	: 2 2/3 HPx(3)
FAN ø	: 805MMx(3)

CONDENSER WITH SLIT FINS
DOUBLE DOOR CONTROL PANEL
ALL DIMENSIONS ARE IN INCHES (MM)



DRAWN BY	ALYN	DATE	21-09-2012
DESIGNED BY	JOSEPHW	DATE	20/12/2017
CHECKED BY		DATE	
APPROVED BY		DATE	

REV	DESCRIPTION	DATE	DRN BY
1.2	UPDATE R410A DATA	04.12.17	JOSEPH
1.1	CHANGE CONDENSER FAN TYPE REVISE DRAWING	03.10.14	CHR

DUNHAM-BUSH INDUSTRIES SDN. BHD

LOCATION.

QTY.

MODEL GACCS 700-P/G

PROJECT STANDARD

TITLE

A/C CONDENSING UNIT

DRAWING NO 82449A-019 REV: 1.2

SCALE : N. T. S SHEET 1 OF 1

EXHIBIT 8

ALL BUSINESS ENTERPRISES CORP.

P.O. Box 8410 Tamuning, Guam U.S.A. 96931
TELEPHONE : (671) 646-3346; FAX: (671) 646-0589

TONY'S WORKSHOP
CARRIER SUBMITTAL

Submittal Cover Sheet Unit Report	HVAC Guide Specification	Condenser Coils
Page #4	50-Tons - Page 11	Page 12 & 15 Condenser Coil - Microchannel Aluminum Tube Coils and Aluminum Fins
Page #16	40-Tons - Page 23	Page 24 & 27 Condenser Coil Microchannel Aluminum Tube Coils & Aluminum Fins
Page #28	15-Tons - Page 37	Page 38 Condenser Coil - Copper Tube Coil, Aluminum Fins
Page #42	15-Tons - Page 50	Page 51 Condenser Coil, Copper Tube Coil, Aluminum Fins
Page #55	20-Tons - Page 63	Page 64 Condenser Coil - Copper Tube Coil, Aluminum Fins
Page #68	20-Tons - Page 76	Page 77 Condenser Coil - Copper Tube Coil, Aluminum Fins
Page #81	40-Tons - Page 88	Page 89 & 92 Condenser Coil - Microchannel, Aluminum Tube Coils, Aluminum Fins
Page #93	40-Tons - Page 100	Page 101 & 104 Condenser Coil - Microchannel Aluminum Tube Coils, Aluminum Fins
Page #105	20-Tons - Page 113	Page 114 Condenser Coil - Copper Tube Coil, Aluminum Fins
Page #118	30-Tons - Page 125	Page 126 & 129 Condenser Coil - Microchannel Aluminum Tube Coils, Aluminum Fins
Page #130	50-Tons - Page 137	Page 138 & 141 Condenser Coils - Microchannel Aluminum Tube Coils, Aluminum Fins
Page #142	20-Tons - Page 150	Page 151 Condenser Coils - Copper Tuber Coils, Aluminum Fin
Page #155	50-Tons - Page 162	Page 163 & 166 Condenser Coils, Microchannel, Aluminum Tube Coils, Aluminum Fins
Page #167	30-Tons - Page 174	Page 175 & 178 Condenser Coils - Microchannel, Aluminum Tube Coils, Aluminum Fins

NOTE: Michochannel is Aluminum Tube Coils and Aluminum Fins is a deviation to major BID Requirements on Copper Tube coil and Copper Fins.

SUBMITTAL

Project

HA-1702-21-11 UOG IFB B21-17 PURCHASING HVAC EQUIP

Date

Wednesday, December 1, 2021

Project Number

HA-1702-21-11

Contractor

UNIVERSITY OF GUAM - PROCUREMENT OFFICE

BERNARD LLARENAS
CARRIER GUAM INC.

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Project: HA-1702-21-11 UOG IFB B21-17 PURCHASING HVAC EQUIP
Prepared By: BERNARD LLARENAS

02:16PM

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Project: HA-1702-21-11 UOG IFB B21-17 PURCHASING HVAC EQUIP
Prepared By: BERNARD LLARENAS

02:16PM

RFK BUILDING SECOND FLOOR 112221

Submittal Cover Sheet
Unit Report
Performance Summary Report
Acoustic Summary
Certified Drawings
Guide Specifications
Feature Sheet

GUIDE SPECIFICATIONS – 38APD05056-3009J

HVAC Guide Specifications
Commercial Air-Cooled Condensing Units with Puron® Refrigerant (R-410A)

Size: 050

Part 1: General

SYSTEM DESCRIPTION

1.01. Outdoor-mounted, air-cooled condensing unit with Puron® refrigerant (R-410A) suitable for on-the-ground or rooftop installation. The 38APD unit shall have two independent refrigeration circuits and shall consist of two, four, five or six rotary scroll compressors. Unit shall have air-cooled coils, propeller-type condenser fans, a control box, and shall discharge condenser air vertically upward as shown on certified drawings. Unit shall be used in refrigeration circuit with a central station air-handling unit or direct-expansion coils.

QUALITY ASSURANCE

1.01. Unit performance shall be rated in accordance with AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Standard 365, latest edition (U.S.A).

1.02. Unit construction shall comply with latest edition of ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) 15 Safety Code, UL 1995, and ASME (American Society of Mechanical Engineers) applicable codes (U.S.A. codes).

1.03. The management system governing the manufacturer of the product is ISO (International Organization for Standardization) 9001:2015 certified.

1.04. Base unit shall be constructed in accordance with UL (Underwriters Laboratories) standards and CSA (Canadian Standards Association)..

1.05. Painted parts shall withstand 1000 hours in constant neutral salt spray under ASTM B117 conditions with a 1mm scribe per ASTM D1654. After test, painted parts shall show no signs of wrinkling or cracking, no loss of adhesion, no evidence of blistering, and the mean creepage shall not exceed 1/4 in. (Rating = 4 per ASTM D1654) on either side of the scribe line.

1.06. Design pressure shall be 650 psig (4482 kPa).

1.07. Unit shall be functional checked at the factory.

1.08. Lifting holes shall be provided to facilitate rigging.

DELIVERY, STORAGE, AND HANDLING

1.01. Unit shall be shipped as single package and shall be stored and handled per unit manufacturer's recommendations.

WARRANTY (FOR INCLUSION BY SPECIFYING ENGINEER)

Part 2: Products

EQUIPMENT

2.01. General:

A. Factory assembled, single-piece, air-cooled condensing unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, compressors, nitrogen holding charge, and special features required prior to field start-up.

2.02. Unit Cabinet:

A. Cabinet shall be galvanized steel casing with a baked enamel powder or pre-painted finish.

B. Control box access panels shall be hinged for service access.

2.03. Fans:

A. Condenser fans shall be direct-drive propeller 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.

2.04. Compressors:

A. Compressors shall be rotary scroll.
B. Operating oil charge and a crankcase heater control oil dilution.
C. Compressors shall be mounted on two rails having rubber in shear vibration isolators.
D. Staging of compressors shall provide unloading capability.
E. 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.

2.05. Condenser Coils:

A. Coil shall be air-cooled microchannel heat exchanger (MCHX) and shall have a series of flat tubes containing a series of multiple, parallel flow microchannels layered between the refrigerant manifolds. Microchannel coils shall consist of a two-pass arrangement. Coil construction shall consist of aluminum alloys for the fins, tubes and manifolds in combination with a corrosion-resistant coating on the tubes.
B. Tubes shall be cleaned, dehydrated, and sealed.
C. Assembled condenser coils shall be leak tested and pressure tested at 650 psig (4482 kPa).

2.06. Refrigeration Components:

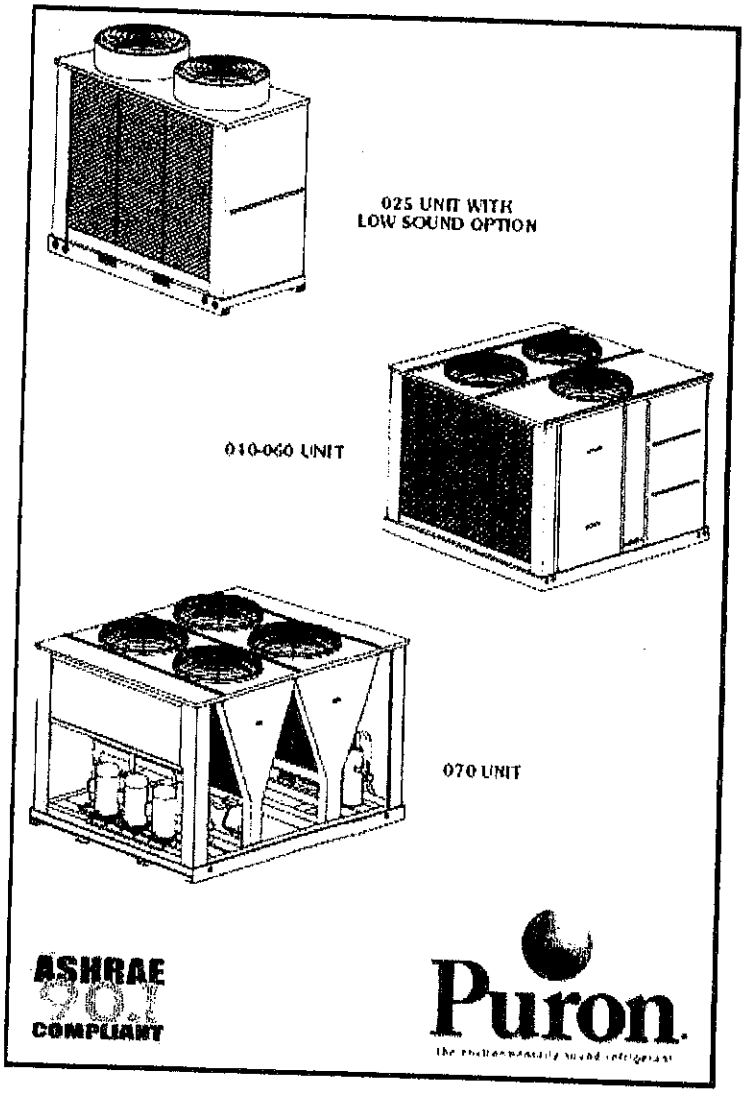
A. Refrigeration circuit components shall include liquid line temperature relief device, pressure transducers, liquid line shutoff valve, suction shutoff valve, suction line accumulators, nitrogen holding charge, and compressor oil.
B. Standard line length (0-100 ft)
C. Long line length check valves are required for liquid line installation on all linear line length applications of more than 100 ft (30.5 m) to prevent liquid migration during unit shutdown. For any 025-030 size dual circuit unit application where evaporator is located higher than the condensing unit, check valves are required for linear line length above 55 ft (16.8 m).
D. Units shall include one factory-installed suction line accumulator for each refrigerant circuit.

2.07. Controls and Safeties:

A. Unit ComfortLink controls shall include:
   1. Scrolling marquee display module shall be used for accessing condensing unit information, reading sensor values, and testing the condensing unit. The scrolling marquee display is a 4-key, 4-character, 16-segment LED (light-emitting diode) display. Eleven mode LEDs shall be located on the display as well as an Alarm Status LED. The display shows all of the ComfortLink control codes (with 60-character expandable clear language), plus set points, time of day, temperatures, pressures, and superheat. Additional information can be displayed all at once with the accessory Navigator™ display.
   2. Carrier Comfort Network® (CCN) system capability.
   3. Unit control with standard pressure transducer, discharge pressure transducer and suction temperature thermistors.
   4. Current alarm list and alarm history list on display.
   5. Automatic compressor lead/lag control.
   6. Service run test capability.
   7. Compressor minimum run time (3 minutes) and minimum off time (3 minutes).
   8. Service diagnostic mode.
   9. Self-contained low voltage control circuit.
   10. Cycle condenser fans to maintain proper head pressure control.
   11. Capacity control with staging compressors.

38AP GEMINISELECT AIR COOLED CONDENSING UNITS

These condensing units feature two independent refrigerant circuits, each circuit having its own highly efficient scroll compressors. All units are factory wired, nitrogen charged, and easily connected by refrigerant lines and control wiring to the matching Carrier air-handling unit (40RU or 39 Series). Various combinations of these extremely flexible condensing units matched with air handlers provide customized packages to cover a wide range of cooling requirements. Low roof-load weight distribution and weatherproof construction make these units excellent selections for rooftop or on-the-ground installations. These 38AP condensing units are well suited for commercial or industrial air conditioning applications.



Gemini Select

These dependable split systems match Carrier's 40RU or 39 Series indoor-air handlers with the versatile outdoor 38AP condensing units for a wide selection of commercial cooling solutions.

- Split condensing units compatible with ASHRAE 90.1
- Chlorine-free, non-ozone depleting Puron refrigerant (R-410A)
- Condenser coils feature the Novation® heat exchanger with microchannel coil technology
- 38APS single-circuit unit has up to 3 rotary scroll compressors
- 38APD unit has up to 6 rotary scroll compressors with 2 independent circuits
- Standard scroll compressor units operate as low as 33% (single circuit) or 15% (dual circuit) of nominal capacity
- Optional digital scroll compressors allow incremental unloading down to 10% (single circuit) or 5% (dual circuit) of nominal capacity for VAV applications
- Protection against high discharge and low suction refrigerant pressure, and low oil pressure

RFK BUILDING FIRST FLOOR 112221

Submittal Cover Sheet
Unit Report
Performance Summary Report
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Guide Specifications
Feature Sheet

GUIDE SPECIFICATIONS – 38APD04056-3009J

HVAC Guide Specifications
Commercial Air-Cooled Condensing Units with Puron® Refrigerant (R-410A)

Size: 040

Part 1: General

SYSTEM DESCRIPTION

1.01. Outdoor-mounted, air-cooled condensing unit with Puron® refrigerant (R-410A) suitable for on-the-ground or rooftop installation. The 38APD unit shall have two independent refrigeration circuits and shall consist of two, four, five or six rotary scroll compressors. Unit shall have air-cooled coils, propeller-type condenser fans, a control box, and shall discharge condenser air vertically upward as shown on certified drawings. Unit shall be used in refrigeration circuit with a central station air-handling unit or direct-expansion coils.

QUALITY ASSURANCE

1.01. Unit performance shall be rated in accordance with AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Standard 365, latest edition (U.S.A).

1.02. Unit construction shall comply with latest edition of ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) 15 Safety Code, UL 1995, and ASME (American Society of Mechanical Engineers) applicable codes (U.S.A. codes).

1.03. The management system governing the manufacturer of the product is ISO (International Organization for Standardization) 9001: 2015 certified.

1.04. Base unit shall be constructed in accordance with UL (Underwriters Laboratories) standards and CSA (Canadian Standards Association)..

1.05. Painted parts shall withstand 1000 hours in constant neutral salt spray under ASTM B117 conditions with a 1mm scribe per ASTM D1654. After test, painted parts shall show no signs of wrinkling or cracking, no loss of adhesion, no evidence of blistering, and the mean creepage shall not exceed 1/4 in. (Rating = 4 per ASTM D1654) on either side of the scribe line.

1.06. Design pressure shall be 650 psig (4482 kPa).

1.07. Unit shall be functional checked at the factory.

1.08. Lifting holes shall be provided to facilitate rigging.

DELIVERY, STORAGE, AND HANDLING

1.01. Unit shall be shipped as single package and shall be stored and handled per unit manufacturer's recommendations.

WARRANTY (FOR INCLUSION BY SPECIFYING ENGINEER)

Part 2: Products

EQUIPMENT

2.01. General:

A. Factory assembled, single-piece, air-cooled condensing unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, compressors, nitrogen holding charge, and special features required prior to field start-up.

2.02. Unit Cabinet:

A. Cabinet shall be galvanized steel casing with a baked enamel powder or pre-painted finish.

B. Control box access panels shall be hinged for service access.

2.03. Fans:

A. Condenser fans shall be direct-drive propeller 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.

2.04. Compressors:

A. Compressors shall be rotary scroll.
B. Operating oil charge and a crankcase heater control oil dilution.
C. Compressors shall be mounted on two rails having rubber in shear vibration isolators.
D. Staging of compressors shall provide unloading capability.
E. 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.

2.05. Condenser Coils:

A. Coil shall be air-cooled microchannel heat exchanger (MCHX) and shall have a series of flat tubes containing a series of multiple, parallel flow microchannels layered between the refrigerant manifolds. Microchannel coils shall consist of a two-pass arrangement. Coil construction shall consist of aluminum alloys for the fins, tubes and manifolds in combination with a corrosion-resistant coating on the tubes.
B. Tubes shall be cleaned, dehydrated, and sealed.
C. Assembled condenser coils shall be leak tested and pressure tested at 650 psig (4482 kPa).

2.06. Refrigeration Components:

A. Refrigeration circuit components shall include liquid line temperature relief device, pressure transducers, liquid line shutoff valve, suction shutoff valve, suction line accumulators, nitrogen holding charge, and compressor oil.
B. Standard line length (0-100 ft)
C. Long line length check valves are required for liquid line installation on all linear line length applications of more than 100 ft (30.5 m) to prevent liquid migration during unit shutdown. For any 025-030 size dual circuit unit application where evaporator is located higher than the condensing unit, check valves are required for linear line length above 55 ft (16.8 m).
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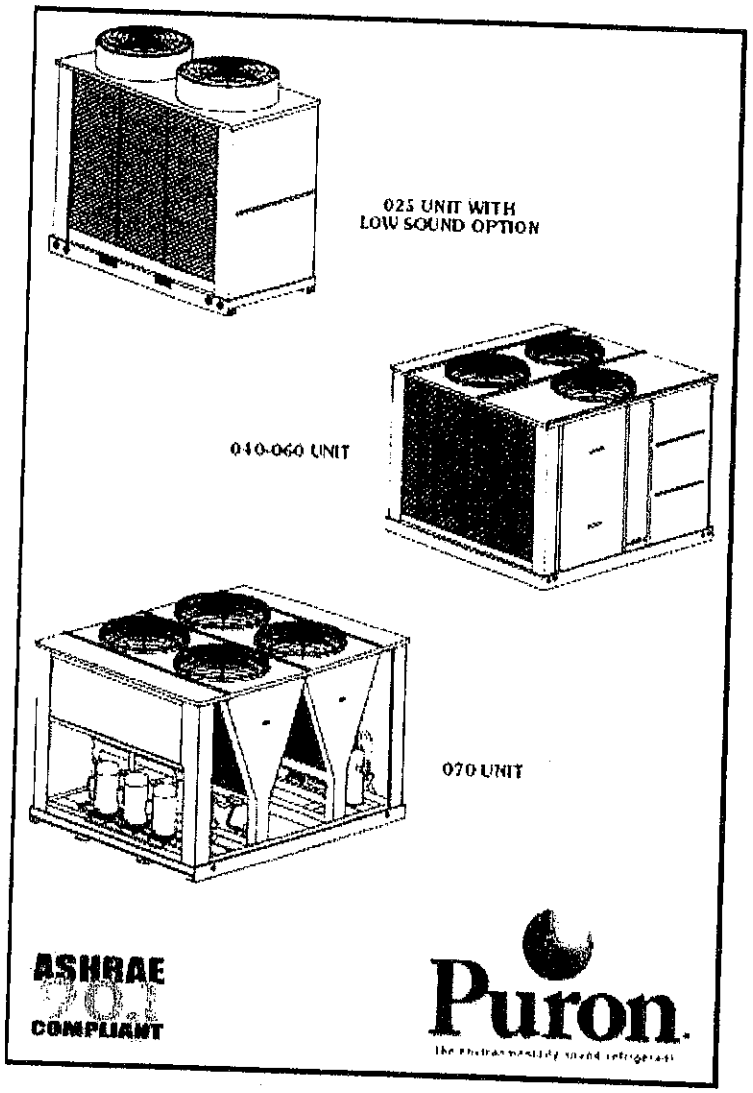
   3. Unit control with standard pressure transducer, discharge pressure transducer and suction temperature thermistors.
   4. Current alarm list and alarm history list on display.
   5. Automatic compressor lead/lag control.
   6. Service run test capability.
   7. Compressor minimum run time (3 minutes) and minimum off time (3 minutes).
   8. Service diagnostic mode.
   9. Self-contained low voltage control circuit.
   10. Cycle condenser fans to maintain proper head pressure control.
   11. Capacity control with staging compressors.

38AP GEMINISELECT AIR COOLED CONDENSING UNITS

These condensing units feature two independent refrigerant circuits, each circuit having its own highly efficient scroll compressors. All units are factory wired, nitrogen charged, and easily connected by refrigerant lines and control wiring to the matching Carrier air-handling unit (40RU or 39 Series). Various combinations of these extremely flexible condensing units matched with air handlers provide customized packages to cover a wide range of cooling requirements. Low roof-load weight distribution and weatherproof construction make these units excellent selections for rooftop or on-the-ground installations. These 38AP condensing units are well suited for commercial or industrial air conditioning applications.



Gemini Select

These dependable split systems match Carrier's 40RU or 39 Series indoor-air handlers with the versatile outdoor 38AP condensing units for a wide selection of commercial cooling solutions.

- Split condensing units compatible with ASHRAE 90.1
- Chlorine-free, non-ozone depleting Puron refrigerant (R-410A)
- Condenser coils feature the Novation® heat exchanger with microchannel coil technology
- 38APS single-circuit unit has up to 3 rotary scroll compressors
- 38APD unit has up to 6 rotary scroll compressors with 2 independent circuits
- Standard scroll compressor units operate as low as 33% (single circuit) or 15% (dual circuit) of nominal capacity
- Optional digital scroll compressors allow incremental unloading down to 10% (single circuit) or 5% (dual circuit) of nominal capacity for VAV applications
- Protection against high discharge and low suction refrigerant pressure, and low oil pressure

20RFK BUILDING FIRST FLOOR MAIN ENTRANCE 112321

Submittal Cover Sheet
Unit Report
Performance Summary Report
Acoustic Summary
Certified Drawings
Guide Specifications
Feature Sheet

GUIDE SPECIFICATIONS – 38AUDA16A0E5-0A0A0

Commercial Air-Cooled Condensing Units
HVAC Guide Specifications

Size: 16

Part 1: General

SYSTEM DESCRIPTION

1.01. Outdoor-mounted, air-cooled condensing unit suitable for on-the-ground or rooftop installation. Unit shall consist of a hermetic scroll air-conditioning compressor(s) assembly, an air-cooled coil, propeller-type condenser fans, and a control box. Unit shall discharge supply air upward as shown on contract drawings. Unit shall be used in a refrigeration circuit matched with a packaged air-handling unit.

QUALITY ASSURANCE

1.01. Unit shall be rated in accordance with AHRI Standard 360.
1.02. Unit construction shall comply with ANSI/ASHRAE 15 safety code latest revision and comply with NEC.
1.03. Unit shall be constructed in accordance with UL 1995 standard and shall carry the UL and UL, Canada label.
1.04. Unit cabinet shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).
1.05. Air-cooled condenser coils for hermetic scroll compressor units (38AUZ) and 38AUD shall be leak tested at 150 psig, and pressure tested at 650 psig.
1.06. Unit shall be manufactured in a facility registered to ISO 9001:2000 manufacturing quality standard.

DELIVERY, STORAGE, AND HANDLING

1.01. Unit shall be shipped as single package only, and shall be stored and handled according to unit manufacturer's recommendations.

WARRANTY (FOR INCLUSION BY SPECIFYING ENGINEER.)

Part 2: Products

EQUIPMENT

2.01. General:

A. Factory-assembled, single piece, air-cooled condensing unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, compressor, holding charge, and special features required prior to field start-up.

2.02. Unit Cabinet:

A. Unit cabinet shall be constructed of galvanized steel, bonderized and coated with a prepainted baked enamel finish.
B. A heavy-gauge roll-formed perimeter base rail with forklift slots and lifting holes shall be provided to facilitate rigging.

2.03. Condenser Fans:

A. Condenser fans shall be direct driven, propeller type, discharging air vertically upward.
B. Fan blades shall be balanced.
C. Condenser fan discharge openings shall be equipped with PVC-coated steel wire safety guards.
D. Condenser fan and motor shaft shall be corrosion resistant.

2.04. Compressor:

A. Compressor shall be of the hermetic scroll type.
B. Compressor shall be mounted on rubber grommets.
C. Compressors shall include overload protection.
D. Compressors shall be equipped with a crankcase heater.
E. Compressor shall be equipped with internal high pressure and high temperature protection.
F. 38AUZ*16 and 25 sizes shall use two scroll compressors manifold together.

2.05. Condenser Coils:

A. Standard Aluminum fin - Copper Tube Coils:
1. Standard evaporator and condenser coils shall have aluminum lanced plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.
2. Evaporator coils shall be leak tested to 150 psig, pressure tested to 450 psig, and qualified to UL 1995 burst test at 1775 psig.
3. Condenser coils shall be leak tested to 150 psig, pressure tested to 650 psig, and qualified to UL 1995 burst test at 1980 psig.

B. Optional Copper-fin evaporator and condenser coils:
1. Shall be constructed of copper fins mechanically bonded to copper tubes and copper tube sheets.
2. Galvanized steel tube sheets shall not be acceptable.
3. A polymer strip shall prevent coil assembly from contacting the sheet metal coil pan to minimize potential for galvanic corrosion between coil and pan.

2.06. Refrigeration Components:

A. Refrigeration circuit components shall include liquid line service valve, suction line service valve, a full charge of compressor oil, and a partial holding charge of refrigerant.

2.07. Controls and Safeties:

A. Minimum control functions shall include:
1. Control wire terminal blocks.
2. Compressor lockout on auto-reset safety until reset from thermostat.
3. Each unit shall utilize the Comfort Alertt Diagnostic Board that provides:
a. System Pressure Trip fault code indication
b. Short Cycling fault code indication
c. Locked Rotor fault code indication
d. Open Circuit fault code indication
e. Reverse Phase 3 fault code indication
f. Welded Contactor fault code indication
g. Low Voltage fault code indication
h. Anti-short cycle protection
i. Phase reversal protection

B. Minimum safety devices which are equipped with automatic reset (after resetting first at thermostat), shall include:
1. High discharge pressure cutout.
2. Low pressure cutout.

2.08. Operating Characteristics:

A. The capacity of the condensing unit shall meet or exceed _____ Btuh at a suction temperature of _____ F. The power consumption at full load shall not exceed _____ kW.
B. The combination of the condensing unit and the evaporator or fan coil unit shall have a total net cooling capacity of _____ Btuh or greater at conditions of _____ cfm entering-air temperature at the evaporator at _____ F wet bulb and _____ F dry bulb, and air entering the condensing unit at _____ F.
C. The system shall have an EER of _____ Btuh/Watt or greater at standard AHRI conditions.
D. Standard unit shall be capable to operate up to 125_F (52_C) and down to 40_F (4_C)

7.5RFK BUILDING FIRST FLOOR AV ROOM 112321

Submittal Cover Sheet
Unit Report
Performance Summary Report
Acoustic Summary
Certified Drawings
Guide Specifications
Feature Sheet

GUIDE SPECIFICATIONS – 38AUDA16A0E5-0A0A0

Commercial Air-Cooled Condensing Units
HVAC Guide Specifications

Size: 16

Part 1: General

SYSTEM DESCRIPTION

1.01. Outdoor-mounted, air-cooled condensing unit suitable for on-the-ground or rooftop installation. Unit shall consist of a hermetic scroll air-conditioning compressor(s) assembly, an air-cooled coil, propeller-type condenser fans, and a control box. Unit shall discharge supply air upward as shown on contract drawings. Unit shall be used in a refrigeration circuit matched with a packaged air-handling unit.

QUALITY ASSURANCE

1.01. Unit shall be rated in accordance with AHRI Standard 360.
1.02. Unit construction shall comply with ANSI/ASHRAE 15 safety code latest revision and comply with NEC.
1.03. Unit shall be constructed in accordance with UL 1995 standard and shall carry the UL and UL, Canada label.
1.04. Unit cabinet shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).
1.05. Air-cooled condenser coils for hermetic scroll compressor units (38AUZ) and 38AUD shall be leak tested at 150 psig, and pressure tested at 650 psig.
1.06. Unit shall be manufactured in a facility registered to ISO 9001:2000 manufacturing quality standard.

DELIVERY, STORAGE, AND HANDLING

1.01. Unit shall be shipped as single package only, and shall be stored and handled according to unit manufacturer's recommendations.

WARRANTY (FOR INCLUSION BY SPECIFYING ENGINEER.)

Part 2: Products

EQUIPMENT

2.01. General:
- A. Factory-assembled, single piece, air-cooled condensing unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, compressor, holding charge, and special features required prior to field start-up.

2.02. Unit Cabinet:
- A. Unit cabinet shall be constructed of galvanized steel, bonderized and coated with a prepainted baked enamel finish.
- B. A heavy-gauge roll-formed perimeter base rail with forklift slots and lifting holes shall be provided to facilitate rigging.

2.03. Condenser Fans:
- A. Condenser fans shall be direct driven, propeller type, discharging air vertically upward.
- B. Fan blades shall be balanced.
- C. Condenser fan discharge openings shall be equipped with PVC-coated steel wire safety guards.
- D. Condenser fan and motor shaft shall be corrosion resistant.

2.04. Compressor:
- A. Compressor shall be of the hermetic scroll type.

B. Compressor shall be mounted on rubber grommets.
C. Compressors shall include overload protection.
D. Compressors shall be equipped with a crankcase heater.
E. Compressor shall be equipped with internal high pressure and high temperature protection.
F. 38AUZ*16 and 25 sizes shall use two scroll compressors manifold together.

2.05. Condenser Coils:

A. Standard Aluminum fin - Copper Tube Coils:
1. Standard evaporator and condenser coils shall have aluminum lanced plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.
2. Evaporator coils shall be leak tested to 150 psig, pressure tested to 450 psig, and qualified to UL 1995 burst test at 1775 psig.
3. Condenser coils shall be leak tested to 150 psig, pressure tested to 650 psig, and qualified to UL 1995 burst test at 1980 psig.

B. Optional Copper-fin evaporator and condenser coils:
1. Shall be constructed of copper fins mechanically bonded to copper tubes and copper tube sheets.
2. Galvanized steel tube sheets shall not be acceptable.
3. A polymer strip shall prevent coil assembly from contacting the sheet metal coil pan to minimize potential for galvanic corrosion between coil and pan.

2.06. Refrigeration Components:

A. Refrigeration circuit components shall include liquid line service valve, suction line service valve, a full charge of compressor oil, and a partial holding charge of refrigerant.

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A. Minimum control functions shall include:
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c. Locked Rotor fault code indication
d. Open Circuit fault code indication
e. Reverse Phase 3 fault code indication
f. Welded Contactor fault code indication
g. Low Voltage fault code indication
h. Anti-short cycle protection
i. Phase reversal protection

B. Minimum safety devices which are equipped with automatic reset (after resetting first at thermostat), shall include:
1. High discharge pressure cutout.
2. Low pressure cutout.

2.08. Operating Characteristics:

A. The capacity of the condensing unit shall meet or exceed _____ Btuh at a suction temperature of _____ F. The power consumption at full load shall not exceed _____ kW.
B. The combination of the condensing unit and the evaporator or fan coil unit shall have a total net cooling capacity of _____ Btuh or greater at conditions of _____ cfm entering-air temperature at the evaporator at _____ F wet bulb and _____ F dry bulb, and air entering the condensing unit at _____ F.
C. The system shall have an EER of _____ Btuh/Watt or greater at standard AHRI conditions.
D. Standard unit shall be capable to operate up to 125_F (52_C) and down to 40_F (4_C)

2.09. Electrical Requirements:

A. Nominal unit electrical characteristics shall be _____ v, 3-ph, 60 Hz. The unit shall be capable of satisfactory operation

7.5RFK BUILDING FIRST FLOOR OFFICES 112321

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GUIDE SPECIFICATIONS – 38AUDA25A0E5-0A0A0

Commercial Air-Cooled Condensing Units
HVAC Guide Specifications

Size: 25

Part 1: General

SYSTEM DESCRIPTION

1.01. Outdoor-mounted, air-cooled condensing unit suitable for on-the-ground or rooftop installation. Unit shall consist of a hermetic scroll air-conditioning compressor(s) assembly, an air-cooled coil, propeller-type condenser fans, and a control box. Unit shall discharge supply air upward as shown on contract drawings. Unit shall be used in a refrigeration circuit matched with a packaged air-handling unit.

QUALITY ASSURANCE

1.01. Unit shall be rated in accordance with AHRI Standard 360.
1.02. Unit construction shall comply with ANSI/ASHRAE 15 safety code latest revision and comply with NEC.
1.03. Unit shall be constructed in accordance with UL 1995 standard and shall carry the UL and UL, Canada label.
1.04. Unit cabinet shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).
1.05. Air-cooled condenser coils for hermetic scroll compressor units (38AUZ) and 38AUD shall be leak tested at 150 psig, and pressure tested at 650 psig.
1.06. Unit shall be manufactured in a facility registered to ISO 9001:2000 manufacturing quality standard.

DELIVERY, STORAGE, AND HANDLING

1.01. Unit shall be shipped as single package only, and shall be stored and handled according to unit manufacturer's recommendations.

WARRANTY (FOR INCLUSION BY SPECIFYING ENGINEER.)

Part 2: Products

EQUIPMENT

2.01. General:
  A. Factory-assembled, single piece, air-cooled condensing unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, compressor, holding charge, and special features required prior to field start-up.
2.02. Unit Cabinet:
  A. Unit cabinet shall be constructed of galvanized steel, bonderized and coated with a prepainted baked enamel finish.
  B. A heavy-gauge roll-formed perimeter base rail with forklift slots and lifting holes shall be provided to facilitate rigging.
2.03. Condenser Fans:
  A. Condenser fans shall be direct driven, propeller type, discharging air vertically upward.
  B. Fan blades shall be balanced.
  C. Condenser fan discharge openings shall be equipped with PVC-coated steel wire safety guards.
  D. Condenser fan and motor shaft shall be corrosion resistant.
2.04. Compressor:
  A. Compressor shall be of the hermetic scroll type.

B. Compressor shall be mounted on rubber grommets.
C. Compressors shall include overload protection.
D. Compressors shall be equipped with a crankcase heater.
E. Compressor shall be equipped with internal high pressure and high temperature protection.
F. 38AUZ*16 and 25 sizes shall use two scroll compressors manifold together.

2.05. Condenser Coils:

A. Standard Aluminum fin - Copper Tube Coils:
1. Standard evaporator and condenser coils shall have aluminum lanced plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.
2. Evaporator coils shall be leak tested to 150 psig, pressure tested to 450 psig, and qualified to UL 1995 burst test at 1775 psig.
3. Condenser coils shall be leak tested to 150 psig, pressure tested to 650 psig, and qualified to UL 1995 burst test at 1980 psig.

B. Optional Copper-fin evaporator and condenser coils:
1. Shall be constructed of copper fins mechanically bonded to copper tubes and copper tube sheets.
2. Galvanized steel tube sheets shall not be acceptable.
3. A polymer strip shall prevent coil assembly from contacting the sheet metal coil pan to minimize potential for galvanic corrosion between coil and pan.

2.06. Refrigeration Components:

A. Refrigeration circuit components shall include liquid line service valve, suction line service valve, a full charge of compressor oil, and a partial holding charge of refrigerant.

2.07. Controls and Safeties:

A. Minimum control functions shall include:
1. Control wire terminal blocks.
2. Compressor lockout on auto-reset safety until reset from thermostat.
3. Each unit shall utilize the Comfort Alertt Diagnostic Board that provides:
a. System Pressure Trip fault code indication
b. Short Cycling fault code indication
c. Locked Rotor fault code indication
d. Open Circuit fault code indication
e. Reverse Phase 3 fault code indication
f. Welded Contactor fault code indication
g. Low Voltage fault code indication
h. Anti-short cycle protection
i. Phase reversal protection

B. Minimum safety devices which are equipped with automatic reset (after resetting first at thermostat), shall include:
1. High discharge pressure cutout.
2. Low pressure cutout.

2.08. Operating Characteristics:

A. The capacity of the condensing unit shall meet or exceed _____ Btuh at a suction temperature of _____ F. The power consumption at full load shall not exceed _____ kW.
B. The combination of the condensing unit and the evaporator or fan coil unit shall have a total net cooling capacity of _____ Btuh or greater at conditions of _____ cfm entering-air temperature at the evaporator at _____ F wet bulb and _____ F dry bulb, and air entering the condensing unit at _____ F.
C. The system shall have an EER of _____ Btuh/Watt or greater at standard AHRI conditions.
D. Standard unit shall be capable to operate up to 125_F (52_C) and down to 40_F (4_C)

2.09. Electrical Requirements:

A. Nominal unit electrical characteristics shall be _____ v, 3-ph, 60 Hz. The unit shall be capable of satisfactory operation

PIP (GLE) SECOND FLOOR 112321

Submittal Cover Sheet
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GUIDE SPECIFICATIONS – 38AUDA25A0E5-0A0A0

Commercial Air-Cooled Condensing Units
HVAC Guide Specifications

Size: 25

Part 1: General

SYSTEM DESCRIPTION

1.01. Outdoor-mounted, air-cooled condensing unit suitable for on-the-ground or rooftop installation. Unit shall consist of a hermetic scroll air-conditioning compressor(s) assembly, an air-cooled coil, propeller-type condenser fans, and a control box. Unit shall discharge supply air upward as shown on contract drawings. Unit shall be used in a refrigeration circuit matched with a packaged air-handling unit.

QUALITY ASSURANCE

1.01. Unit shall be rated in accordance with AHRI Standard 360.
1.02. Unit construction shall comply with ANSI/ASHRAE 15 safety code latest revision and comply with NEC.
1.03. Unit shall be constructed in accordance with UL 1995 standard and shall carry the UL and UL, Canada label.
1.04. Unit cabinet shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).
1.05. Air-cooled condenser coils for hermetic scroll compressor units (38AUZ) and 38AUD shall be leak tested at 150 psig, and pressure tested at 650 psig.
1.06. Unit shall be manufactured in a facility registered to ISO 9001:2000 manufacturing quality standard.

DELIVERY, STORAGE, AND HANDLING

1.01. Unit shall be shipped as single package only, and shall be stored and handled according to unit manufacturer's recommendations.

WARRANTY (FOR INCLUSION BY SPECIFYING ENGINEER.)

Part 2: Products

EQUIPMENT

2.01. General:
- A. Factory-assembled, single piece, air-cooled condensing unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, compressor, holding charge, and special features required prior to field start-up.

2.02. Unit Cabinet:
- A. Unit cabinet shall be constructed of galvanized steel, bonderized and coated with a prepainted baked enamel finish.
- B. A heavy-gauge roll-formed perimeter base rail with forklift slots and lifting holes shall be provided to facilitate rigging.

2.03. Condenser Fans:
- A. Condenser fans shall be direct driven, propeller type, discharging air vertically upward.
- B. Fan blades shall be balanced.
- C. Condenser fan discharge openings shall be equipped with PVC-coated steel wire safety guards.
- D. Condenser fan and motor shaft shall be corrosion resistant.

2.04. Compressor:
- A. Compressor shall be of the hermetic scroll type.

B. Compressor shall be mounted on rubber grommets.
C. Compressors shall include overload protection.
D. Compressors shall be equipped with a crankcase heater.
E. Compressor shall be equipped with internal high pressure and high temperature protection.
F. 38AUZ*16 and 25 sizes shall use two scroll compressors manifold together.

2.05. Condenser Coils:

A. Standard Aluminum fin - Copper Tube Coils:
1. Standard evaporator and condenser coils shall have aluminum lanced plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.
2. Evaporator coils shall be leak tested to 150 psig, pressure tested to 450 psig, and qualified to UL 1995 burst test at 1775 psig.
3. Condenser coils shall be leak tested to 150 psig, pressure tested to 650 psig, and qualified to UL 1995 burst test at 1980 psig.

B. Optional Copper-fin evaporator and condenser coils:
1. Shall be constructed of copper fins mechanically bonded to copper tubes and copper tube sheets.
2. Galvanized steel tube sheets shall not be acceptable.
3. A polymer strip shall prevent coil assembly from contacting the sheet metal coil pan to minimize potential for galvanic corrosion between coil and pan.

2.06. Refrigeration Components:

A. Refrigeration circuit components shall include liquid line service valve, suction line service valve, a full charge of compressor oil, and a partial holding charge of refrigerant.

2.07. Controls and Safeties:

A. Minimum control functions shall include:
1. Control wire terminal blocks.
2. Compressor lockout on auto-reset safety until reset from thermostat.
3. Each unit shall utilize the Comfort Alertt Diagnostic Board that provides:
a. System Pressure Trip fault code indication
b. Short Cycling fault code indication
c. Locked Rotor fault code indication
d. Open Circuit fault code indication
e. Reverse Phase 3 fault code indication
f. Welded Contactor fault code indication
g. Low Voltage fault code indication
h. Anti-short cycle protection
i. Phase reversal protection

B. Minimum safety devices which are equipped with automatic reset (after resetting first at thermostat), shall include:
1. High discharge pressure cutout.
2. Low pressure cutout.

2.08. Operating Characteristics:

A. The capacity of the condensing unit shall meet or exceed _____ Btuh at a suction temperature of _____ F. The power consumption at full load shall not exceed _____ kW.
B. The combination of the condensing unit and the evaporator or fan coil unit shall have a total net cooling capacity of _____ Btuh or greater at conditions of _____ cfm entering-air temperature at the evaporator at _____ F wet bulb and _____ F dry bulb, and air entering the condensing unit at _____ F.
C. The system shall have an EER of _____ Btuh/Watt or greater at standard AHRI conditions.
D. Standard unit shall be capable to operate up to 125_F (52_C) and down to 40_F (4_C)

2.09. Electrical Requirements:

A. Nominal unit electrical characteristics shall be _____ v, 3-ph, 60 Hz. The unit shall be capable of satisfactory operation

10SCIENCE BUILDING FIRST FLOOR 112221

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GUIDE SPECIFICATIONS – 38APD04056-3009J

HVAC Guide Specifications
Commercial Air-Cooled Condensing Units with Puron® Refrigerant (R-410A)

Size: 040

Part 1: General

SYSTEM DESCRIPTION

1.01. Outdoor-mounted, air-cooled condensing unit with Puron® refrigerant (R-410A) suitable for on-the-ground or rooftop installation. The 38APD unit shall have two independent refrigeration circuits and shall consist of two, four, five or six rotary scroll compressors. Unit shall have air-cooled coils, propeller-type condenser fans, a control box, and shall discharge condenser air vertically upward as shown on certified drawings. Unit shall be used in refrigeration circuit with a central station air-handling unit or direct-expansion coils.

QUALITY ASSURANCE

1.01. Unit performance shall be rated in accordance with AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Standard 365, latest edition (U.S.A).

1.02. Unit construction shall comply with latest edition of ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) 15 Safety Code, UL 1995, and ASME (American Society of Mechanical Engineers) applicable codes (U.S.A. codes).

1.03. The management system governing the manufacturer of the product is ISO (International Organization for Standardization) 9001:2015 certified.

1.04. Base unit shall be constructed in accordance with UL (Underwriters Laboratories) standards and CSA (Canadian Standards Association)..

1.05. Painted parts shall withstand 1000 hours in constant neutral salt spray under ASTM B117 conditions with a 1mm scribe per ASTM D1654. After test, painted parts shall show no signs of wrinkling or cracking, no loss of adhesion, no evidence of blistering, and the mean creepage shall not exceed 1/4 in. (Rating = 4 per ASTM D1654) on either side of the scribe line.

1.06. Design pressure shall be 650 psig (4482 kPa).

1.07. Unit shall be functional checked at the factory.

1.08. Lifting holes shall be provided to facilitate rigging.

DELIVERY, STORAGE, AND HANDLING

1.01. Unit shall be shipped as single package and shall be stored and handled per unit manufacturer's recommendations.

WARRANTY (FOR INCLUSION BY SPECIFYING ENGINEER)

Part 2: Products

EQUIPMENT

2.01. General:

A. Factory assembled, single-piece, air-cooled condensing unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, compressors, nitrogen holding charge, and special features required prior to field start-up.

2.02. Unit Cabinet:

A. Cabinet shall be galvanized steel casing with a baked enamel powder or pre-painted finish.

B. Control box access panels shall be hinged for service access.

2.03. Fans:

A. Condenser fans shall be direct-drive propeller 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.

2.04. Compressors:

A. Compressors shall be rotary scroll.
B. Operating oil charge and a crankcase heater control oil dilution.
C. Compressors shall be mounted on two rails having rubber in shear vibration isolators.
D. Staging of compressors shall provide unloading capability.
E. 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.

2.05. Condenser Coils:

A. Coil shall be air-cooled microchannel heat exchanger (MCHX) and shall have a series of flat tubes containing a series of multiple, parallel flow microchannels layered between the refrigerant manifolds. Microchannel coils shall consist of a two-pass arrangement. Coil construction shall consist of aluminum alloys for the fins, tubes and manifolds in combination with a corrosion-resistant coating on the tubes.
B. Tubes shall be cleaned, dehydrated, and sealed.
C. Assembled condenser coils shall be leak tested and pressure tested at 650 psig (4482 kPa).

2.06. Refrigeration Components:

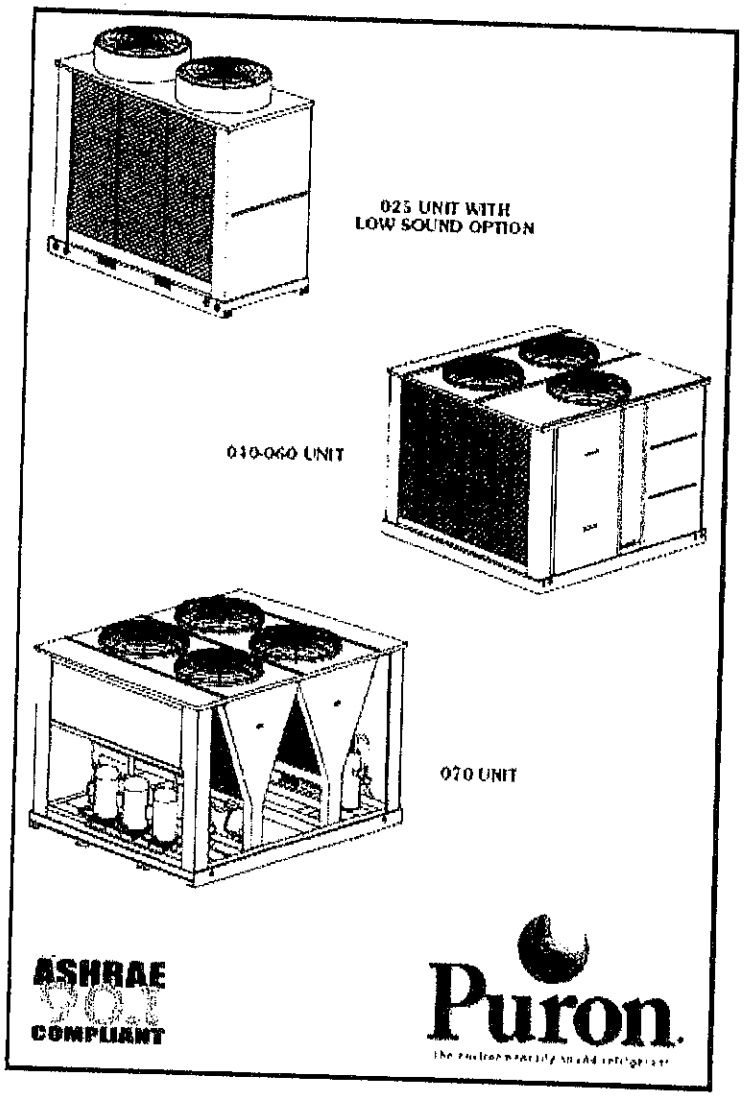
A. Refrigeration circuit components shall include liquid line temperature relief device, pressure transducers, liquid line shutoff valve, suction shutoff valve, suction line accumulators, nitrogen holding charge, and compressor oil.
B. Standard line length (0-100 ft)
C. Long line length check valves are required for liquid line installation on all linear line length applications of more than 100 ft (30.5 m) to prevent liquid migration during unit shutdown. For any 025-030 size dual circuit unit application where evaporator is located higher than the condensing unit, check valves are required for linear line length above 55 ft (16.8 m).
D. Units shall include one factory-installed suction line accumulator for each refrigerant circuit.

2.07. Controls and Safeties:

A. Unit ComfortLink controls shall include:
   1. Scrolling marquee display module shall be used for accessing condensing unit information, reading sensor values, and testing the condensing unit. The scrolling marquee display is a 4-key, 4-character, 16-segment LED (light-emitting diode) display. Eleven mode LEDs shall be located on the display as well as an Alarm Status LED. The display shows all of the ComfortLink control codes (with 60-character expandable clear language), plus set points, time of day, temperatures, pressures, and superheat. Additional information can be displayed all at once with the accessory Navigator™ display.
   2. Carrier Comfort Network® (CCN) system capability.
   3. Unit control with standard pressure transducer, discharge pressure transducer and suction temperature thermistors.
   4. Current alarm list and alarm history list on display.
   5. Automatic compressor lead/lag control.
   6. Service run test capability.
   7. Compressor minimum run time (3 minutes) and minimum off time (3 minutes).
   8. Service diagnostic mode.
   9. Self-contained low voltage control circuit.
   10. Cycle condenser fans to maintain proper head pressure control.
   11. Capacity control with staging compressors.

38AP GEMINISELECT AIR COOLED CONDENSING UNITS

These condensing units feature two independent refrigerant circuits, each circuit having its own highly efficient scroll compressors. All units are factory wired, nitrogen charged, and easily connected by refrigerant lines and control wiring to the matching Carrier air-handling unit (40RU or 39 Series). Various combinations of these extremely flexible condensing units matched with air handlers provide customized packages to cover a wide range of cooling requirements. Low roof-load weight distribution and weatherproof construction make these units excellent selections for rooftop or on-the-ground installations. These 38AP condensing units are well suited for commercial or industrial air conditioning applications.



Gemini Select

These dependable split systems match Carrier's 40RU or 39 Series indoor-air handlers with the versatile outdoor 38AP condensing units for a wide selection of commercial cooling solutions.

- Split condensing units compatible with ASHRAE 90.1
- Chlorine-free, non-ozone depleting Puron refrigerant (R-410A)
- Condenser coils feature the Novation® heat exchanger with microchannel coil technology
- 38APS single-circuit unit has up to 3 rotary scroll compressors
- 38APD unit has up to 6 rotary scroll compressors with 2 independent circuits
- Standard scroll compressor units operate as low as 33% (single circuit) or 15% (dual circuit) of nominal capacity
- Optional digital scroll compressors allow incremental unloading down to 10% (single circuit) or 5% (dual circuit) of nominal capacity for VAV applications
- Protection against high discharge and low suction refrigerant pressure, and low oil pressure

20SCIENCE BUILDING SECOND FLOOR 112221

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GUIDE SPECIFICATIONS – 38APD04056-3009J

HVAC Guide Specifications
Commercial Air-Cooled Condensing Units with Puron® Refrigerant (R-410A)

Size: 040

Part 1: General

SYSTEM DESCRIPTION

1.01. Outdoor-mounted, air-cooled condensing unit with Puron® refrigerant (R-410A) suitable for on-the-ground or rooftop installation. The 38APD unit shall have two independent refrigeration circuits and shall consist of two, four, five or six rotary scroll compressors. Unit shall have air-cooled coils, propeller-type condenser fans, a control box, and shall discharge condenser air vertically upward as shown on certified drawings. Unit shall be used in refrigeration circuit with a central station air-handling unit or direct-expansion coils.

QUALITY ASSURANCE

1.01. Unit performance shall be rated in accordance with AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Standard 365, latest edition (U.S.A).

1.02. Unit construction shall comply with latest edition of ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) 15 Safety Code, UL 1995, and ASME (American Society of Mechanical Engineers) applicable codes (U.S.A. codes).

1.03. The management system governing the manufacturer of the product is ISO (International Organization for Standardization) 9001:2015 certified.

1.04. Base unit shall be constructed in accordance with UL (Underwriters Laboratories) standards and CSA (Canadian Standards Association)..

1.05. Painted parts shall withstand 1000 hours in constant neutral salt spray under ASTM B117 conditions with a 1mm scribe per ASTM D1654. After test, painted parts shall show no signs of wrinkling or cracking, no loss of adhesion, no evidence of blistering, and the mean creepage shall not exceed 1/4 in. (Rating = 4 per ASTM D1654) on either side of the scribe line.

1.06. Design pressure shall be 650 psig (4482 kPa).

1.07. Unit shall be functional checked at the factory.

1.08. Lifting holes shall be provided to facilitate rigging.

DELIVERY, STORAGE, AND HANDLING

1.01. Unit shall be shipped as single package and shall be stored and handled per unit manufacturer's recommendations.

WARRANTY (FOR INCLUSION BY SPECIFYING ENGINEER)

Part 2: Products

EQUIPMENT

2.01. General:

A. Factory assembled, single-piece, air-cooled condensing unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, compressors, nitrogen holding charge, and special features required prior to field start-up.

2.02. Unit Cabinet:

A. Cabinet shall be galvanized steel casing with a baked enamel powder or pre-painted finish.

B. Control box access panels shall be hinged for service access.

2.03. Fans:

A. Condenser fans shall be direct-drive propeller 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.

2.04. Compressors:

A. Compressors shall be rotary scroll.
B. Operating oil charge and a crankcase heater control oil dilution.
C. Compressors shall be mounted on two rails having rubber in shear vibration isolators.
D. Staging of compressors shall provide unloading capability.
E. 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.

2.05. Condenser Coils:

A. Coil shall be air-cooled microchannel heat exchanger (MCHX) and shall have a series of flat tubes containing a series of multiple, parallel flow microchannels layered between the refrigerant manifolds. Microchannel coils shall consist of a two-pass arrangement. Coil construction shall consist of aluminum alloys for the fins, tubes and manifolds in combination with a corrosion-resistant coating on the tubes.
B. Tubes shall be cleaned, dehydrated, and sealed.
C. Assembled condenser coils shall be leak tested and pressure tested at 650 psig (4482 kPa).

2.06. Refrigeration Components:

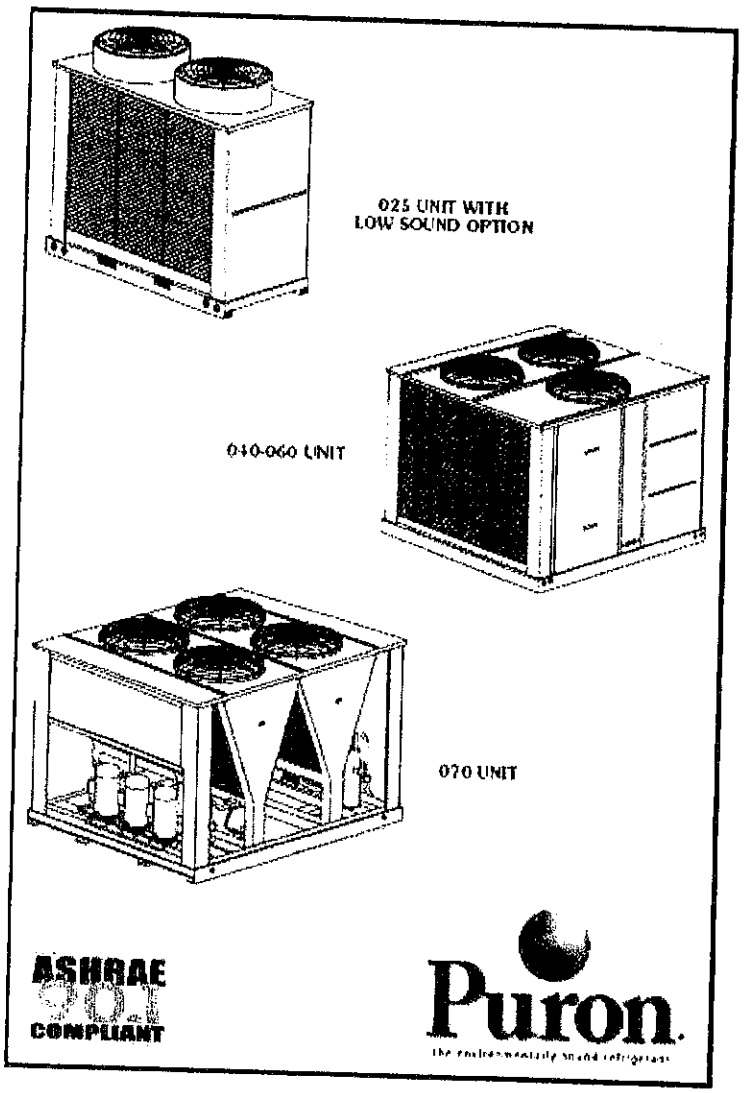
A. Refrigeration circuit components shall include liquid line temperature relief device, pressure transducers, liquid line shutoff valve, suction shutoff valve, suction line accumulators, nitrogen holding charge, and compressor oil.
B. Standard line length (0-100 ft)
C. Long line length check valves are required for liquid line installation on all linear line length applications of more than 100 ft (30.5 m) to prevent liquid migration during unit shutdown. For any 025-030 size dual circuit unit application where evaporator is located higher than the condensing unit, check valves are required for linear line length above 55 ft (16.8 m).
D. Units shall include one factory-installed suction line accumulator for each refrigerant circuit.

2.07. Controls and Safeties:

A. Unit ComfortLink controls shall include:
   1. Scrolling marquee display module shall be used for accessing condensing unit information, reading sensor values, and testing the condensing unit. The scrolling marquee display is a 4-key, 4-character, 16-segment LED (light-emitting diode) display. Eleven mode LEDs shall be located on the display as well as an Alarm Status LED. The display shows all of the ComfortLink control codes (with 60-character expandable clear language), plus set points, time of day, temperatures, pressures, and superheat. Additional information can be displayed all at once with the accessory Navigator™ display.
   2. Carrier Comfort Network® (CCN) system capability.
   3. Unit control with standard pressure transducer, discharge pressure transducer and suction temperature thermistors.
   4. Current alarm list and alarm history list on display.
   5. Automatic compressor lead/lag control.
   6. Service run test capability.
   7. Compressor minimum run time (3 minutes) and minimum off time (3 minutes).
   8. Service diagnostic mode.
   9. Self-contained low voltage control circuit.
   10. Cycle condenser fans to maintain proper head pressure control.
   11. Capacity control with staging compressors.

38AP GEMINISELECT AIR COOLED CONDENSING UNITS

These condensing units feature two independent refrigerant circuits, each circuit having its own highly efficient scroll compressors. All units are factory wired, nitrogen charged, and easily connected by refrigerant lines and control wiring to the matching Carrier air-handling unit (40RU or 39 Series). Various combinations of these extremely flexible condensing units matched with air handlers provide customized packages to cover a wide range of cooling requirements. Low roof-load weight distribution and weatherproof construction make these units excellent selections for rooftop or on-the-ground installations. These 38AP condensing units are well suited for commercial or industrial air conditioning applications.



Gemini Select

These dependable split systems match Carrier's 40RU or 39 Series indoor-air handlers with the versatile outdoor 38AP condensing units for a wide selection of commercial cooling solutions.

- Split condensing units compatible with ASHRAE 90.1
- Chlorine-free, non-ozone depleting Puron refrigerant (R-410A)
- Condenser coils feature the Novation® heat exchanger with microchannel coil technology
- 38APS single-circuit unit has up to 3 rotary scroll compressors
- 38APD unit has up to 6 rotary scroll compressors with 2 independent circuits
- Standard scroll compressor units operate as low as 33% (single circuit) or 15% (dual circuit) of nominal capacity
- Optional digital scroll compressors allow incremental unloading down to 10% (single circuit) or 5% (dual circuit) of nominal capacity for VAV applications
- Protection against high discharge and low suction refrigerant pressure, and low oil pressure

20SCIENCE BUILDING THIRD FLOOR 112321

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GUIDE SPECIFICATIONS – 38AUDA25A0E5-0A0A0

Commercial Air-Cooled Condensing Units
HVAC Guide Specifications

Size: 25

Part 1: General

SYSTEM DESCRIPTION

1.01. Outdoor-mounted, air-cooled condensing unit suitable for on-the-ground or rooftop installation. Unit shall consist of a hermetic scroll air-conditioning compressor(s) assembly, an air-cooled coil, propeller-type condenser fans, and a control box. Unit shall discharge supply air upward as shown on contract drawings. Unit shall be used in a refrigeration circuit matched with a packaged air-handling unit.

QUALITY ASSURANCE

1.01. Unit shall be rated in accordance with AHRI Standard 360.
1.02. Unit construction shall comply with ANSI/ASHRAE 15 safety code latest revision and comply with NEC.
1.03. Unit shall be constructed in accordance with UL 1995 standard and shall carry the UL and UL, Canada label.
1.04. Unit cabinet shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).
1.05. Air-cooled condenser coils for hermetic scroll compressor units (38AUZ) and 38AUD shall be leak tested at 150 psig, and pressure tested at 650 psig.
1.06. Unit shall be manufactured in a facility registered to ISO 9001:2000 manufacturing quality standard.

DELIVERY, STORAGE, AND HANDLING

1.01. Unit shall be shipped as single package only, and shall be stored and handled according to unit manufacturer's recommendations.

WARRANTY (FOR INCLUSION BY SPECIFYING ENGINEER.)

Part 2: Products

EQUIPMENT

2.01. General:
- A. Factory-assembled, single piece, air-cooled condensing unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, compressor, holding charge, and special features required prior to field start-up.

2.02. Unit Cabinet:
- A. Unit cabinet shall be constructed of galvanized steel, bonderized and coated with a prepainted baked enamel finish.
- B. A heavy-gauge roll-formed perimeter base rail with forklift slots and lifting holes shall be provided to facilitate rigging.

2.03. Condenser Fans:
- A. Condenser fans shall be direct driven, propeller type, discharging air vertically upward.
- B. Fan blades shall be balanced.
- C. Condenser fan discharge openings shall be equipped with PVC-coated steel wire safety guards.
- D. Condenser fan and motor shaft shall be corrosion resistant.

2.04. Compressor:
- A. Compressor shall be of the hermetic scroll type.

B. Compressor shall be mounted on rubber grommets.
C. Compressors shall include overload protection.
D. Compressors shall be equipped with a crankcase heater.
E. Compressor shall be equipped with internal high pressure and high temperature protection.
F. 38AUZ*16 and 25 sizes shall use two scroll compressors manifold together.

2.05. Condenser Coils:
A. Standard Aluminum fin - Copper Tube Coils:
1. Standard evaporator and condenser coils shall have aluminum lanced plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.
2. Evaporator coils shall be leak tested to 150 psig, pressure tested to 450 psig, and qualified to UL 1995 burst test at 1775 psig.
3. Condenser coils shall be leak tested to 150 psig, pressure tested to 650 psig, and qualified to UL 1995 burst test at 1980 psig.
B. Optional Copper-fin evaporator and condenser coils:
1. Shall be constructed of copper fins mechanically bonded to copper tubes and copper tube sheets.
2. Galvanized steel tube sheets shall not be acceptable.
3. A polymer strip shall prevent coil assembly from contacting the sheet metal coil pan to minimize potential for galvanic corrosion between coil and pan.

2.06. Refrigeration Components:
A. Refrigeration circuit components shall include liquid line service valve, suction line service valve, a full charge of compressor oil, and a partial holding charge of refrigerant.

2.07. Controls and Safeties:
A. Minimum control functions shall include:
1. Control wire terminal blocks.
2. Compressor lockout on auto-reset safety until reset from thermostat.
3. Each unit shall utilize the Comfort Alertt Diagnostic Board that provides:
a. System Pressure Trip fault code indication
b. Short Cycling fault code indication
c. Locked Rotor fault code indication
d. Open Circuit fault code indication
e. Reverse Phase 3 fault code indication
f. Welded Contactor fault code indication
g. Low Voltage fault code indication
h. Anti-short cycle protection
i. Phase reversal protection
B. Minimum safety devices which are equipped with automatic reset (after resetting first at thermostat), shall include:
1. High discharge pressure cutout.
2. Low pressure cutout.

2.08. Operating Characteristics:
A. The capacity of the condensing unit shall meet or exceed _____ Btuh at a suction temperature of _____ F. The power consumption at full load shall not exceed _____ kW.
B. The combination of the condensing unit and the evaporator or fan coil unit shall have a total net cooling capacity of _____ Btuh or greater at conditions of _____ cfm entering-air temperature at the evaporator at _____ F wet bulb and _____ F dry bulb, and air entering the condensing unit at _____ F.
C. The system shall have an EER of _____ Btuh/Watt or greater at standard AHRI conditions.
D. Standard unit shall be capable to operate up to 125_F (52_C) and down to 40_F (4_C)

2.09. Electrical Requirements:
A. Nominal unit electrical characteristics shall be _____ v, 3-ph, 60 Hz. The unit shall be capable of satisfactory operation

10EGLISH COMMUNICATION BULDING CLASSROOM 112221

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GUIDE SPECIFICATIONS – 38APD03056-3009J

HVAC Guide Specifications
Commercial Air-Cooled Condensing Units with Puron® Refrigerant (R-410A)

Size: 030

Part 1: General

SYSTEM DESCRIPTION

1.01. Outdoor-mounted, air-cooled condensing unit with Puron® refrigerant (R-410A) suitable for on-the-ground or rooftop installation. The 38APD unit shall have two independent refrigeration circuits and shall consist of two, four, five or six rotary scroll compressors. Unit shall have air-cooled coils, propeller-type condenser fans, a control box, and shall discharge condenser air vertically upward as shown on certified drawings. Unit shall be used in refrigeration circuit with a central station air-handling unit or direct-expansion coils.

QUALITY ASSURANCE

1.01. Unit performance shall be rated in accordance with AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Standard 365, latest edition (U.S.A).

1.02. Unit construction shall comply with latest edition of ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) 15 Safety Code, UL 1995, and ASME (American Society of Mechanical Engineers) applicable codes (U.S.A. codes).

1.03. The management system governing the manufacturer of the product is ISO (International Organization for Standardization) 9001:2015 certified.

1.04. Base unit shall be constructed in accordance with UL (Underwriters Laboratories) standards and CSA (Canadian Standards Association)..

1.05. Painted parts shall withstand 1000 hours in constant neutral salt spray under ASTM B117 conditions with a 1mm scribe per ASTM D1654. After test, painted parts shall show no signs of wrinkling or cracking, no loss of adhesion, no evidence of blistering, and the mean creepage shall not exceed 1/4 in. (Rating = 4 per ASTM D1654) on either side of the scribe line.

1.06. Design pressure shall be 650 psig (4482 kPa).

1.07. Unit shall be functional checked at the factory.

1.08. Lifting holes shall be provided to facilitate rigging.

DELIVERY, STORAGE, AND HANDLING

1.01. Unit shall be shipped as single package and shall be stored and handled per unit manufacturer's recommendations.

WARRANTY (FOR INCLUSION BY SPECIFYING ENGINEER)

Part 2: Products

EQUIPMENT

2.01. General:

A. Factory assembled, single-piece, air-cooled condensing unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, compressors, nitrogen holding charge, and special features required prior to field start-up.

2.02. Unit Cabinet:

A. Cabinet shall be galvanized steel casing with a baked enamel powder or pre-painted finish.
B. Control box access panels shall be hinged for service access.

2.03. Fans:

A. Condenser fans shall be direct-drive propeller 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.

2.04. Compressors:

A. Compressors shall be rotary scroll.
B. Operating oil charge and a crankcase heater control oil dilution.
C. Compressors shall be mounted on two rails having rubber in shear vibration isolators.
D. Staging of compressors shall provide unloading capability.
E. 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.

2.05. Condenser Coils:

A. Coil shall be air-cooled microchannel heat exchanger (MCHX) and shall have a series of flat tubes containing a series of multiple, parallel flow microchannels layered between the refrigerant manifolds. Microchannel coils shall consist of a two-pass arrangement. Coil construction shall consist of aluminum alloys for the fins, tubes and manifolds in combination with a corrosion-resistant coating on the tubes.
B. Tubes shall be cleaned, dehydrated, and sealed.
C. Assembled condenser coils shall be leak tested and pressure tested at 650 psig (4482 kPa).

2.06. Refrigeration Components:

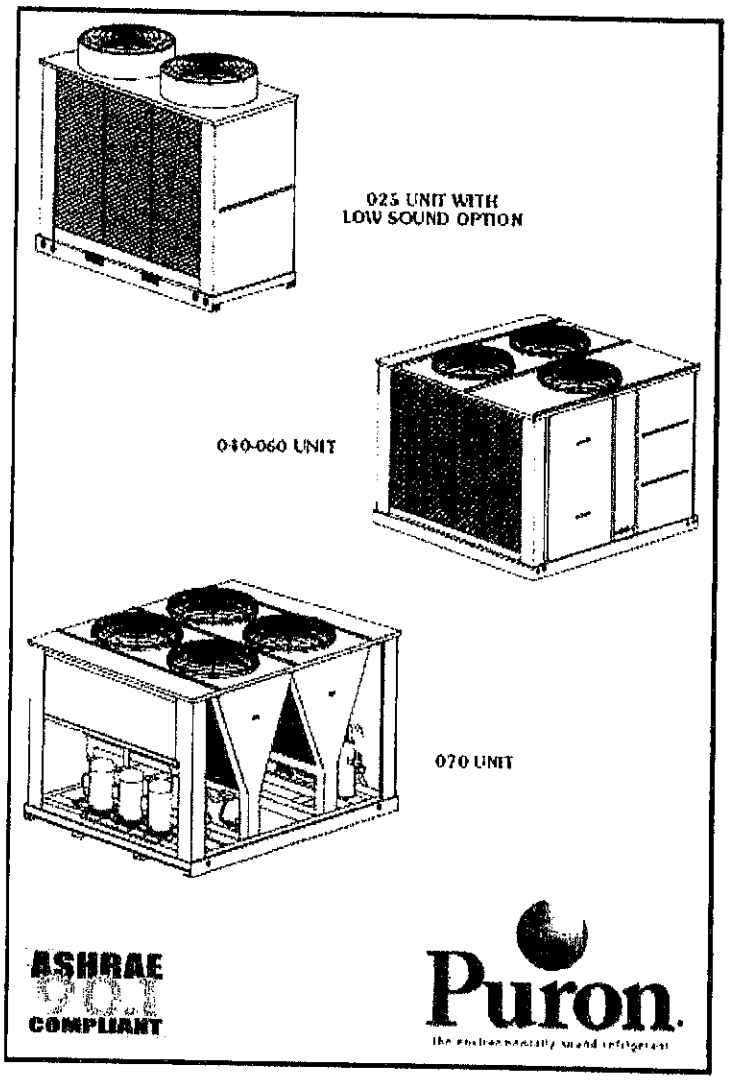
A. Refrigeration circuit components shall include liquid line temperature relief device, pressure transducers, liquid line shutoff valve, suction shutoff valve, suction line accumulators, nitrogen holding charge, and compressor oil.
B. Standard line length (0-100 ft)
C. Long line length check valves are required for liquid line installation on all linear line length applications of more than 100 ft (30.5 m) to prevent liquid migration during unit shutdown. For any 025-030 size dual circuit unit application where evaporator is located higher than the condensing unit, check valves are required for linear line length above 55 ft (16.8 m).
D. Units shall include one factory-installed suction line accumulator for each refrigerant circuit.

2.07. Controls and Safeties:

A. Unit ComfortLink controls shall include:
1. Scrolling marquee display module shall be used for accessing condensing unit information, reading sensor values, and testing the condensing unit. The scrolling marquee display is a 4-key, 4-character, 16-segment LED (light-emitting diode) display. Eleven mode LEDs shall be located on the display as well as an Alarm Status LED. The display shows all of the ComfortLink control codes (with 60-character expandable clear language), plus set points, time of day, temperatures, pressures, and superheat. Additional information can be displayed all at once with the accessory Navigator™ display.
2. Carrier Comfort Network® (CCN) system capability.
3. Unit control with standard pressure transducer, discharge pressure transducer and suction temperature thermistors.
4. Current alarm list and alarm history list on display.
5. Automatic compressor lead/lag control.
6. Service run test capability.
7. Compressor minimum run time (3 minutes) and minimum off time (3 minutes).
8. Service diagnostic mode.
9. Self-contained low voltage control circuit.

38AP GEMINISELECT AIR COOLED CONDENSING UNITS

These condensing units feature two independent refrigerant circuits, each circuit having its own highly efficient scroll compressors. All units are factory wired, nitrogen charged, and easily connected by refrigerant lines and control wiring to the matching Carrier air-handling unit (40RU or 39 Series). Various combinations of these extremely flexible condensing units matched with air handlers provide customized packages to cover a wide range of cooling requirements. Low roof-load weight distribution and weatherproof construction make these units excellent selections for rooftop or on-the-ground installations. These 38AP condensing units are well suited for commercial or industrial air conditioning applications.



Gemini Select

These dependable split systems match Carrier's 40RU or 39 Series indoor-air handlers with the versatile outdoor 38AP condensing units for a wide selection of commercial cooling solutions.

- Split condensing units compatible with ASHRAE 90.1
- Chlorine-free, non-ozone depleting Puron refrigerant (R-410A)
- Condenser coils feature the Novation® heat exchanger with microchannel coil technology
- 38APS single-circuit unit has up to 3 rotary scroll compressors
- 38APD unit has up to 6 rotary scroll compressors with 2 independent circuits
- Standard scroll compressor units operate as low as 33% (single circuit) or 15% (dual circuit) of nominal capacity
- Optional digital scroll compressors allow incremental unloading down to 10% (single circuit) or 5% (dual circuit) of nominal capacity for VAV applications
- Protection against high discharge and low suction refrigerant pressure, and low oil pressure

15COMPUTER CENTER OIT BUILDING FIRST FLOOR 112221

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GUIDE SPECIFICATIONS – 38APD05056-3009J

HVAC Guide Specifications
Commercial Air-Cooled Condensing Units with Puron® Refrigerant (R-410A)

Size: 050

Part 1: General

SYSTEM DESCRIPTION

1.01. Outdoor-mounted, air-cooled condensing unit with Puron® refrigerant (R-410A) suitable for on-the-ground or rooftop installation. The 38APD unit shall have two independent refrigeration circuits and shall consist of two, four, five or six rotary scroll compressors. Unit shall have air-cooled coils, propeller-type condenser fans, a control box, and shall discharge condenser air vertically upward as shown on certified drawings. Unit shall be used in refrigeration circuit with a central station air-handling unit or direct-expansion coils.

QUALITY ASSURANCE

1.01. Unit performance shall be rated in accordance with AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Standard 365, latest edition (U.S.A).

1.02. Unit construction shall comply with latest edition of ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) 15 Safety Code, UL 1995, and ASME (American Society of Mechanical Engineers) applicable codes (U.S.A. codes).

1.03. The management system governing the manufacturer of the product is ISO (International Organization for Standardization) 9001:2015 certified.

1.04. Base unit shall be constructed in accordance with UL (Underwriters Laboratories) standards and CSA (Canadian Standards Association)..

1.05. Painted parts shall withstand 1000 hours in constant neutral salt spray under ASTM B117 conditions with a 1mm scribe per ASTM D1654. After test, painted parts shall show no signs of wrinkling or cracking, no loss of adhesion, no evidence of blistering, and the mean creepage shall not exceed 1/4 in. (Rating = 4 per ASTM D1654) on either side of the scribe line.

1.06. Design pressure shall be 650 psig (4482 kPa).

1.07. Unit shall be functional checked at the factory.

1.08. Lifting holes shall be provided to facilitate rigging.

DELIVERY, STORAGE, AND HANDLING

1.01. Unit shall be shipped as single package and shall be stored and handled per unit manufacturer's recommendations.

WARRANTY (FOR INCLUSION BY SPECIFYING ENGINEER)

Part 2: Products

EQUIPMENT

2.01. General:

A. Factory assembled, single-piece, air-cooled condensing unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, compressors, nitrogen holding charge, and special features required prior to field start-up.

2.02. Unit Cabinet:

A. Cabinet shall be galvanized steel casing with a baked enamel powder or pre-painted finish.
B. Control box access panels shall be hinged for service access.

2.03. Fans:

A. Condenser fans shall be direct-drive propeller 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.

2.04. Compressors:

A. Compressors shall be rotary scroll.
B. Operating oil charge and a crankcase heater control oil dilution.
C. Compressors shall be mounted on two rails having rubber in shear vibration isolators.
D. Staging of compressors shall provide unloading capability.
E. 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.

2.05. Condenser Coils:

A. Coil shall be air-cooled microchannel heat exchanger (MCHX) and shall have a series of flat tubes containing a series of multiple, parallel flow microchannels layered between the refrigerant manifolds. Microchannel coils shall consist of a two-pass arrangement. Coil construction shall consist of aluminum alloys for the fins, tubes and manifolds in combination with a corrosion-resistant coating on the tubes.
B. Tubes shall be cleaned, dehydrated, and sealed.
C. Assembled condenser coils shall be leak tested and pressure tested at 650 psig (4482 kPa).

2.06. Refrigeration Components:

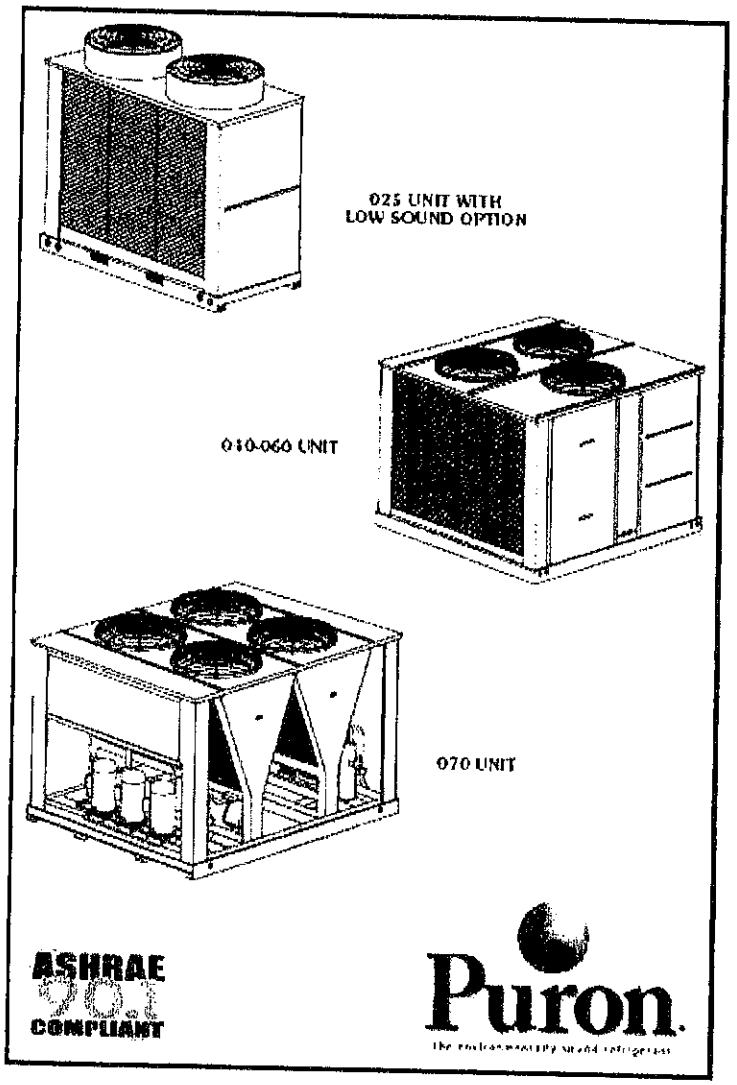
A. Refrigeration circuit components shall include liquid line temperature relief device, pressure transducers, liquid line shutoff valve, suction shutoff valve, suction line accumulators, nitrogen holding charge, and compressor oil.
B. Standard line length (0-100 ft)
C. Long line length check valves are required for liquid line installation on all linear line length applications of more than 100 ft (30.5 m) to prevent liquid migration during unit shutdown. For any 025-030 size dual circuit unit application where evaporator is located higher than the condensing unit, check valves are required for linear line length above 55 ft (16.8 m).
D. Units shall include one factory-installed suction line accumulator for each refrigerant circuit.

2.07. Controls and Safeties:

A. Unit ComfortLink controls shall include:
   1. Scrolling marquee display module shall be used for accessing condensing unit information, reading sensor values, and testing the condensing unit. The scrolling marquee display is a 4-key, 4-character, 16-segment LED (light-emitting diode) display. Eleven mode LEDs shall be located on the display as well as an Alarm Status LED. The display shows all of the ComfortLink control codes (with 60-character expandable clear language), plus set points, time of day, temperatures, pressures, and superheat. Additional information can be displayed all at once with the accessory Navigator™ display.
   2. Carrier Comfort Network® (CCN) system capability.
   3. Unit control with standard pressure transducer, discharge pressure transducer and suction temperature thermistors.
   4. Current alarm list and alarm history list on display.
   5. Automatic compressor lead/lag control.
   6. Service run test capability.
   7. Compressor minimum run time (3 minutes) and minimum off time (3 minutes).
   8. Service diagnostic mode.
   9. Self-contained low voltage control circuit.

38AP GEMINISELECT AIR COOLED CONDENSING UNITS

These condensing units feature two independent refrigerant circuits, each circuit having its own highly efficient scroll compressors. All units are factory wired, nitrogen charged, and easily connected by refrigerant lines and control wiring to the matching Carrier air-handling unit (40RU or 39 Series). Various combinations of these extremely flexible condensing units matched with air handlers provide customized packages to cover a wide range of cooling requirements. Low roof-load weight distribution and weatherproof construction make these units excellent selections for rooftop or on-the-ground installations. These 38AP condensing units are well suited for commercial or industrial air conditioning applications.



Gemini Select

These dependable split systems match Carrier's 40RU or 39 Series indoor-air handlers with the versatile outdoor 38AP condensing units for a wide selection of commercial cooling solutions.

- Split condensing units compatible with ASHRAE 90.1
- Chlorine-free, non-ozone depleting Puron refrigerant (R-410A)
- Condenser coils feature the Novation® heat exchanger with microchannel coil technology
- 38APS single-circuit unit has up to 3 rotary scroll compressors
- 38APD unit has up to 6 rotary scroll compressors with 2 independent circuits
- Standard scroll compressor units operate as low as 33% (single circuit) or 15% (dual circuit) of nominal capacity
- Optional digital scroll compressors allow incremental unloading down to 10% (single circuit) or 5% (dual circuit) of nominal capacity for VAV applications
- Protection against high discharge and low suction refrigerant pressure, and low oil pressure

LECTURE HALL AUDITORIUM 112321

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GUIDE SPECIFICATIONS – 38AUDA25A0E5-0A0A0

Commercial Air-Cooled Condensing Units
HVAC Guide Specifications

Size: 25

Part 1: General

SYSTEM DESCRIPTION

1.01. Outdoor-mounted, air-cooled condensing unit suitable for on-the-ground or rooftop installation. Unit shall consist of a hermetic scroll air-conditioning compressor(s) assembly, an air-cooled coil, propeller-type condenser fans, and a control box. Unit shall discharge supply air upward as shown on contract drawings. Unit shall be used in a refrigeration circuit matched with a packaged air-handling unit.

QUALITY ASSURANCE

1.01. Unit shall be rated in accordance with AHRI Standard 360.
1.02. Unit construction shall comply with ANSI/ASHRAE 15 safety code latest revision and comply with NEC.
1.03. Unit shall be constructed in accordance with UL 1995 standard and shall carry the UL and UL, Canada label.
1.04. Unit cabinet shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).
1.05. Air-cooled condenser coils for hermetic scroll compressor units (38AUZ) and 38AUD shall be leak tested at 150 psig, and pressure tested at 650 psig.
1.06. Unit shall be manufactured in a facility registered to ISO 9001:2000 manufacturing quality standard.

DELIVERY, STORAGE, AND HANDLING

1.01. Unit shall be shipped as single package only, and shall be stored and handled according to unit manufacturer's recommendations.

WARRANTY (FOR INCLUSION BY SPECIFYING ENGINEER.)

Part 2: Products

EQUIPMENT

2.01. General:
  A. Factory-assembled, single piece, air-cooled condensing unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, compressor, holding charge, and special features required prior to field start-up.
2.02. Unit Cabinet:
  A. Unit cabinet shall be constructed of galvanized steel, bonderized and coated with a prepainted baked enamel finish.
  B. A heavy-gauge roll-formed perimeter base rail with forklift slots and lifting holes shall be provided to facilitate rigging.
2.03. Condenser Fans:
  A. Condenser fans shall be direct driven, propeller type, discharging air vertically upward.
  B. Fan blades shall be balanced.
  C. Condenser fan discharge openings shall be equipped with PVC-coated steel wire safety guards.
  D. Condenser fan and motor shaft shall be corrosion resistant.
2.04. Compressor:
  A. Compressor shall be of the hermetic scroll type.

B. Compressor shall be mounted on rubber grommets.
C. Compressors shall include overload protection.
D. Compressors shall be equipped with a crankcase heater.
E. Compressor shall be equipped with internal high pressure and high temperature protection.
F. 38AUZ*16 and 25 sizes shall use two scroll compressors manifold together.

2.05. Condenser Coils:
A. Standard Aluminum fin - Copper Tube Coils:
1. Standard evaporator and condenser coils shall have aluminum lanced plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.
2. Evaporator coils shall be leak tested to 150 psig, pressure tested to 450 psig, and qualified to UL 1995 burst test at 1775 psig.
3. Condenser coils shall be leak tested to 150 psig, pressure tested to 650 psig, and qualified to UL 1995 burst test at 1980 psig.
B. Optional Copper-fin evaporator and condenser coils:
1. Shall be constructed of copper fins mechanically bonded to copper tubes and copper tube sheets.
2. Galvanized steel tube sheets shall not be acceptable.
3. A polymer strip shall prevent coil assembly from contacting the sheet metal coil pan to minimize potential for galvanic corrosion between coil and pan.

2.06. Refrigeration Components:
A. Refrigeration circuit components shall include liquid line service valve, suction line service valve, a full charge of compressor oil, and a partial holding charge of refrigerant.

2.07. Controls and Safeties:
A. Minimum control functions shall include:
1. Control wire terminal blocks.
2. Compressor lockout on auto-reset safety until reset from thermostat.
3. Each unit shall utilize the Comfort Alertt Diagnostic Board that provides:
a. System Pressure Trip fault code indication
b. Short Cycling fault code indication
c. Locked Rotor fault code indication
d. Open Circuit fault code indication
e. Reverse Phase 3 fault code indication
f. Welded Contactor fault code indication
g. Low Voltage fault code indication
h. Anti-short cycle protection
i. Phase reversal protection
B. Minimum safety devices which are equipped with automatic reset (after resetting first at thermostat), shall include:
1. High discharge pressure cutout.
2. Low pressure cutout.

2.08. Operating Characteristics:
A. The capacity of the condensing unit shall meet or exceed _____ Btuh at a suction temperature of _____ F. The power consumption at full load shall not exceed _____ kW.
B. The combination of the condensing unit and the evaporator or fan coil unit shall have a total net cooling capacity of _____ Btuh or greater at conditions of _____ cfm entering-air temperature at the evaporator at _____ F wet bulb and _____ F dry bulb, and air entering the condensing unit at _____ F.
C. The system shall have an EER of _____ Btuh/Watt or greater at standard AHRI conditions.
D. Standard unit shall be capable to operate up to 125_F (52_C) and down to 40_F (4_C)

2.09. Electrical Requirements:
A. Nominal unit electrical characteristics shall be _____ v, 3-ph, 60 Hz. The unit shall be capable of satisfactory operation

HSS BUILDING 50T 112221

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GUIDE SPECIFICATIONS – 38APD05056-3009J

HVAC Guide Specifications
Commercial Air-Cooled Condensing Units with Puron® Refrigerant (R-410A)

Size: 050

Part 1: General

SYSTEM DESCRIPTION

1.01. Outdoor-mounted, air-cooled condensing unit with Puron® refrigerant (R-410A) suitable for on-the-ground or rooftop installation. The 38APD unit shall have two independent refrigeration circuits and shall consist of two, four, five or six rotary scroll compressors. Unit shall have air-cooled coils, propeller-type condenser fans, a control box, and shall discharge condenser air vertically upward as shown on certified drawings. Unit shall be used in refrigeration circuit with a central station air-handling unit or direct-expansion coils.

QUALITY ASSURANCE

1.01. Unit performance shall be rated in accordance with AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Standard 365, latest edition (U.S.A).

1.02. Unit construction shall comply with latest edition of ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) 15 Safety Code, UL 1995, and ASME (American Society of Mechanical Engineers) applicable codes (U.S.A. codes).

1.03. The management system governing the manufacturer of the product is ISO (International Organization for Standardization) 9001: 2015 certified.

1.04. Base unit shall be constructed in accordance with UL (Underwriters Laboratories) standards and CSA (Canadian Standards Association)..

1.05. Painted parts shall withstand 1000 hours in constant neutral salt spray under ASTM B117 conditions with a 1mm scribe per ASTM D1654. After test, painted parts shall show no signs of wrinkling or cracking, no loss of adhesion, no evidence of blistering, and the mean creepage shall not exceed 1/4 in. (Rating = 4 per ASTM D1654) on either side of the scribe line.

1.06. Design pressure shall be 650 psig (4482 kPa).

1.07. Unit shall be functional checked at the factory.

1.08. Lifting holes shall be provided to facilitate rigging.

DELIVERY, STORAGE, AND HANDLING

1.01. Unit shall be shipped as single package and shall be stored and handled per unit manufacturer's recommendations.

WARRANTY (FOR INCLUSION BY SPECIFYING ENGINEER)

Part 2: Products

EQUIPMENT

2.01. General:

A. Factory assembled, single-piece, air-cooled condensing unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, compressors, nitrogen holding charge, and special features required prior to field start-up.

2.02. Unit Cabinet:

A. Cabinet shall be galvanized steel casing with a baked enamel powder or pre-painted finish.

B. Control box access panels shall be hinged for service access.

2.03. Fans:

A. Condenser fans shall be direct-drive propeller 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.

2.04. Compressors:

A. Compressors shall be rotary scroll.
B. Operating oil charge and a crankcase heater control oil dilution.
C. Compressors shall be mounted on two rails having rubber in shear vibration isolators.
D. Staging of compressors shall provide unloading capability.
E. 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.

2.05. Condenser Coils:

A. Coil shall be air-cooled microchannel heat exchanger (MCHX) and shall have a series of flat tubes containing a series of multiple, parallel flow microchannels layered between the refrigerant manifolds. Microchannel coils shall consist of a two-pass arrangement. Coil construction shall consist of aluminum alloys for the fins, tubes and manifolds in combination with a corrosion-resistant coating on the tubes.
B. Tubes shall be cleaned, dehydrated, and sealed.
C. Assembled condenser coils shall be leak tested and pressure tested at 650 psig (4482 kPa).

2.06. Refrigeration Components:

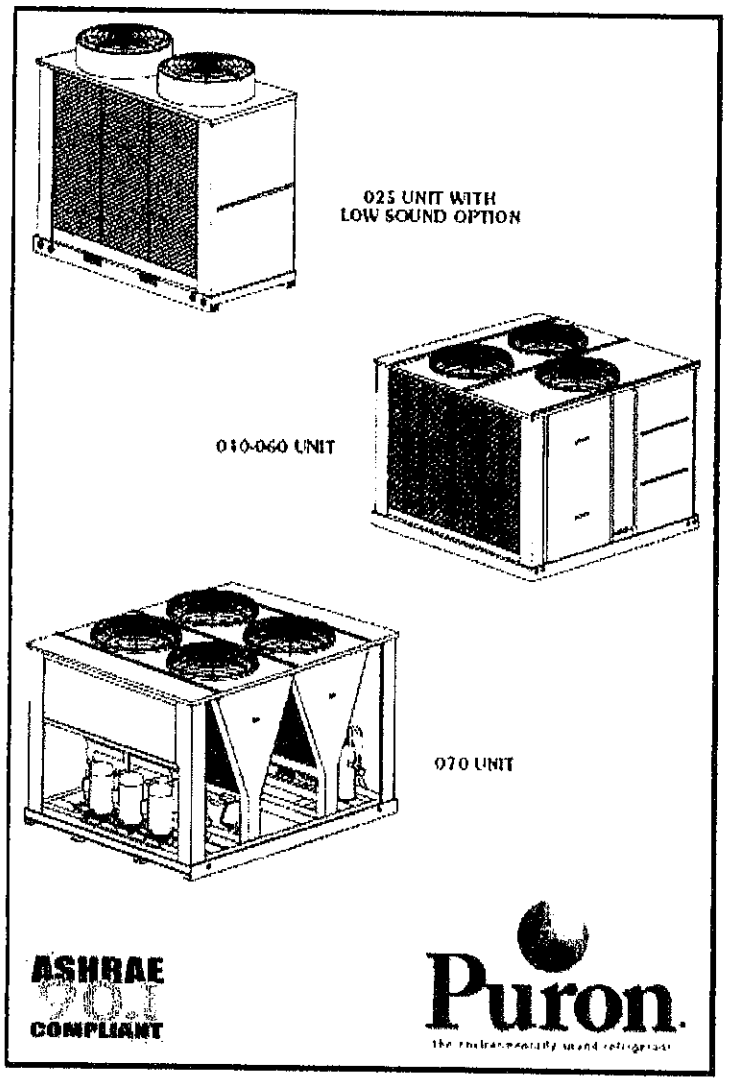
A. Refrigeration circuit components shall include liquid line temperature relief device, pressure transducers, liquid line shutoff valve, suction shutoff valve, suction line accumulators, nitrogen holding charge, and compressor oil.
B. Standard line length (0-100 ft)
C. Long line length check valves are required for liquid line installation on all linear line length applications of more than 100 ft (30.5 m) to prevent liquid migration during unit shutdown. For any 025-030 size dual circuit unit application where evaporator is located higher than the condensing unit, check valves are required for linear line length above 55 ft (16.8 m).
D. Units shall include one factory-installed suction line accumulator for each refrigerant circuit.

2.07. Controls and Safeties:

A. Unit ComfortLink controls shall include:
   1. Scrolling marquee display module shall be used for accessing condensing unit information, reading sensor values, and testing the condensing unit. The scrolling marquee display is a 4-key, 4-character, 16-segment LED (light-emitting diode) display. Eleven mode LEDs shall be located on the display as well as an Alarm Status LED. The display shows all of the ComfortLink control codes (with 60-character expandable clear language), plus set points, time of day, temperatures, pressures, and superheat. Additional information can be displayed all at once with the accessory Navigator™ display.
   2. Carrier Comfort Network® (CCN) system capability.
   3. Unit control with standard pressure transducer, discharge pressure transducer and suction temperature thermistors.
   4. Current alarm list and alarm history list on display.
   5. Automatic compressor lead/lag control.
   6. Service run test capability.
   7. Compressor minimum run time (3 minutes) and minimum off time (3 minutes).
   8. Service diagnostic mode.
   9. Self-contained low voltage control circuit.
   10. Cycle condenser fans to maintain proper head pressure control.
   11. Capacity control with staging compressors.

38AP GEMINISELECT AIR COOLED CONDENSING UNITS

These condensing units feature two independent refrigerant circuits, each circuit having its own highly efficient scroll compressors. All units are factory wired, nitrogen charged, and easily connected by refrigerant lines and control wiring to the matching Carrier air-handling unit (40RU or 39 Series). Various combinations of these extremely flexible condensing units matched with air handlers provide customized packages to cover a wide range of cooling requirements. Low roof-load weight distribution and weatherproof construction make these units excellent selections for rooftop or on-the-ground installations. These 38AP condensing units are well suited for commercial or industrial air conditioning applications.



Gemini Select

These dependable split systems match Carrier's 40RU or 39 Series indoor-air handlers with the versatile outdoor 38AP condensing units for a wide selection of commercial cooling solutions.

- Split condensing units compatible with ASHRAE 90.1
- Chlorine-free, non-ozone depleting Puron refrigerant (R-410A)
- Condenser coils feature the Novation® heat exchanger with microchannel coil technology
- 38APS single-circuit unit has up to 3 rotary scroll compressors
- 38APD unit has up to 6 rotary scroll compressors with 2 independent circuits
- Standard scroll compressor units operate as low as 33% (single circuit) or 15% (dual circuit) of nominal capacity
- Optional digital scroll compressors allow incremental unloading down to 10% (single circuit) or 5% (dual circuit) of nominal capacity for VAV applications
- Protection against high discharge and low suction refrigerant pressure, and low oil pressure

HSS BUILDING 30T 112221

Submittal Cover Sheet
Unit Report
Performance Summary Report
Acoustic Summary
Certified Drawings
Guide Specifications
Feature Sheet

GUIDE SPECIFICATIONS – 38APD03056-3009J

HVAC Guide Specifications
Commercial Air-Cooled Condensing Units with Puron® Refrigerant (R-410A)

Size: 030

Part 1: General

SYSTEM DESCRIPTION

1.01. Outdoor-mounted, air-cooled condensing unit with Puron® refrigerant (R-410A) suitable for on-the-ground or rooftop installation. The 38APD unit shall have two independent refrigeration circuits and shall consist of two, four, five or six rotary scroll compressors. Unit shall have air-cooled coils, propeller-type condenser fans, a control box, and shall discharge condenser air vertically upward as shown on certified drawings. Unit shall be used in refrigeration circuit with a central station air-handling unit or direct-expansion coils.

QUALITY ASSURANCE

1.01. Unit performance shall be rated in accordance with AHRI (Air-Conditioning, Heating, and Refrigeration Institute) Standard 365, latest edition (U.S.A).

1.02. Unit construction shall comply with latest edition of ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) 15 Safety Code, UL 1995, and ASME (American Society of Mechanical Engineers) applicable codes (U.S.A. codes).

1.03. The management system governing the manufacturer of the product is ISO (International Organization for Standardization) 9001:2015 certified.

1.04. Base unit shall be constructed in accordance with UL (Underwriters Laboratories) standards and CSA (Canadian Standards Association)..

1.05. Painted parts shall withstand 1000 hours in constant neutral salt spray under ASTM B117 conditions with a 1mm scribe per ASTM D1654. After test, painted parts shall show no signs of wrinkling or cracking, no loss of adhesion, no evidence of blistering, and the mean creepage shall not exceed 1/4 in. (Rating = 4 per ASTM D1654) on either side of the scribe line.

1.06. Design pressure shall be 650 psig (4482 kPa).

1.07. Unit shall be functional checked at the factory.

1.08. Lifting holes shall be provided to facilitate rigging.

DELIVERY, STORAGE, AND HANDLING

1.01. Unit shall be shipped as single package and shall be stored and handled per unit manufacturer's recommendations.

WARRANTY (FOR INCLUSION BY SPECIFYING ENGINEER)

Part 2: Products

EQUIPMENT

2.01. General:

A. Factory assembled, single-piece, air-cooled condensing unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, compressors, nitrogen holding charge, and special features required prior to field start-up.

2.02. Unit Cabinet:

A. Cabinet shall be galvanized steel casing with a baked enamel powder or pre-painted finish.

B. Control box access panels shall be hinged for service access.

2.03. Fans:

A. Condenser fans shall be direct-drive propeller 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.

2.04. Compressors:

A. Compressors shall be rotary scroll.

B. Operating oil charge and a crankcase heater control oil dilution.

C. Compressors shall be mounted on two rails having rubber in shear vibration isolators.

D. Staging of compressors shall provide unloading capability.

E. 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.

2.05. Condenser Coils:

A. Coil shall be air-cooled microchannel heat exchanger (MCHX) and shall have a series of flat tubes containing a series of multiple, parallel flow microchannels layered between the refrigerant manifolds. Microchannel coils shall consist of a two-pass arrangement. Coil construction shall consist of aluminum alloys for the fins, tubes and manifolds in combination with a corrosion-resistant coating on the tubes.

B. Tubes shall be cleaned, dehydrated, and sealed.

C. Assembled condenser coils shall be leak tested and pressure tested at 650 psig (4482 kPa).

2.06. Refrigeration Components:

A. Refrigeration circuit components shall include liquid line temperature relief device, pressure transducers, liquid line shutoff valve, suction shutoff valve, suction line accumulators, nitrogen holding charge, and compressor oil.

B. Standard line length (0-100 ft)

C. Long line length check valves are required for liquid line installation on all linear line length applications of more than 100 ft (30.5 m) to prevent liquid migration during unit shutdown. For any 025-030 size dual circuit unit application where evaporator is located higher than the condensing unit, check valves are required for linear line length above 55 ft (16.8 m).

D. Units shall include one factory-installed suction line accumulator for each refrigerant circuit.

2.07. Controls and Safeties:

A. Unit ComfortLink controls shall include:

1. Scrolling marquee display module shall be used for accessing condensing unit information, reading sensor values, and testing the condensing unit. The scrolling marquee display is a 4-key, 4-character, 16-segment LED (light-emitting diode) display. Eleven mode LEDs shall be located on the display as well as an Alarm Status LED. The display shows all of the ComfortLink control codes (with 60-character expandable clear language), plus set points, time of day, temperatures, pressures, and superheat. Additional information can be displayed all at once with the accessory Navigator™ display.
2. Carrier Comfort Network® (CCN) system capability.
3. Unit control with standard pressure transducer, discharge pressure transducer and suction temperature thermistors.
4. Current alarm list and alarm history list on display.
5. Automatic compressor lead/lag control.
6. Service run test capability.
7. Compressor minimum run time (3 minutes) and minimum off time (3 minutes).
8. Service diagnostic mode.
9. Self-contained low voltage control circuit.
10. Cycle condenser fans to maintain proper head pressure control.
11. Capacity control with staging compressors.

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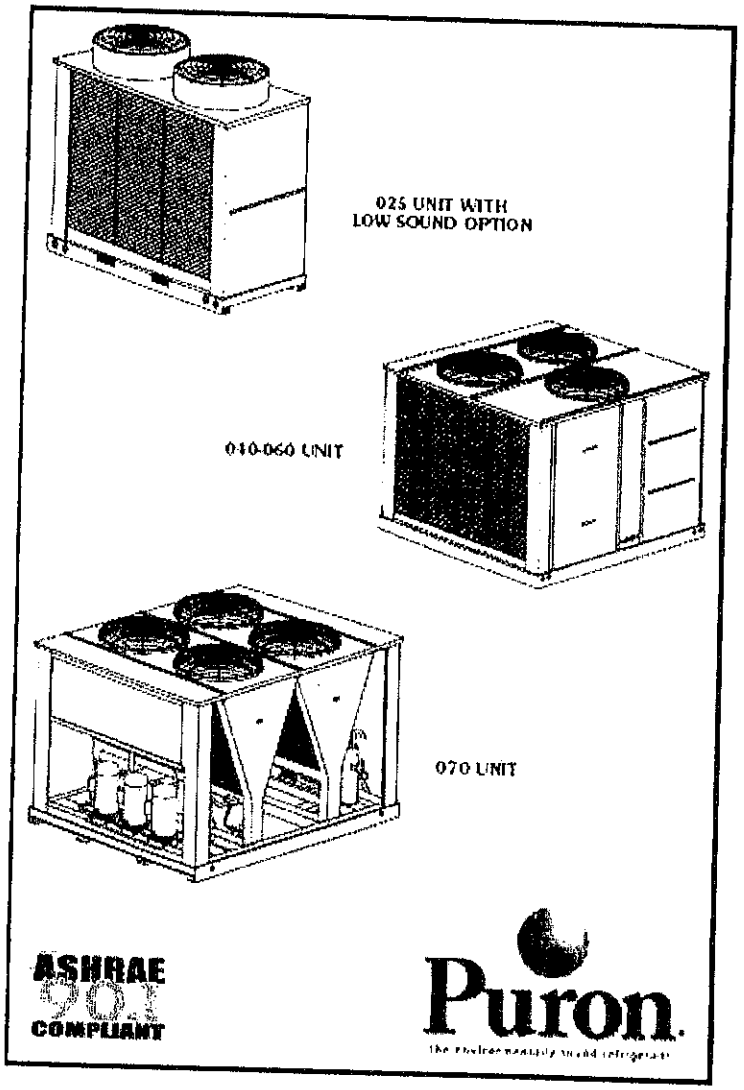

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- Condenser coils feature the Novation® heat exchanger with microchannel coil technology
- 38APS single-circuit unit has up to 3 rotary scroll compressors
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- Standard scroll compressor units operate as low as 33% (single circuit) or 15% (dual circuit) of nominal capacity
- Optional digital scroll compressors allow incremental unloading down to 10% (single circuit) or 5% (dual circuit) of nominal capacity for VAV applications
- Protection against high discharge and low suction refrigerant pressure, and low oil pressure

EXHIBIT 9

ALL BUSINESS ENTERPRISES CORP.

P.O. Box 8410 Tamuning, Guam U.S.A. 96931

TELEPHONE : (671) 646-3346; FAX: (671) 646-0589

JWS SUBMITTAL

TECHNICAL REPORT — SPECIFICATION

Pages	Description	Pages	Condenser Coil
1 of 12 & UOG 27	Nothing describe on Factory immersions Spray Phenolic Coating	3 of 12 & UOG 28	Copper Tube Coil, Aluminum Fins
1 of 12 & UOG 30	Nothing describe on Factory immersions Spray Phenolic Coating	3 of 12 & UOG 31	Copper Tube Coil, Aluminum Fins
1 of 12 & UOG 33	Nothing describe on Factory immersions Spray Phenolic Coating	3 of 12 & UOG 34	Copper Tube Coil, Aluminum Fins
1 of 12 & UOG 36	Nothing describe on Factory immersions Spray Phenolic Coating	3 of 12 & UOG 37	Copper Tube Coil, Aluminum Fins
1 of 12 & UOG 39	Nothing describe on Factory immersions Spray Phenolic Coating	3 of 12 & UOG 40	Copper Tube Coil, Aluminum Fins
1 of 12 & UOG 42	Nothing describe on Factory immersions Spray Phenolic Coating	3 of 12 & UOG 43	Copper Tube Coil, Aluminum Fins
1 of 12 & UOG 45	Nothing describe on Factory immersions Spray Phenolic Coating	3 of 12 & UOG 46	Copper Tube Coil, Aluminum Fins
1 of 12 & UOG 48	Nothing describe on Factory immersions Spray Phenolic Coating	3 of 12 & UOG 49	Copper Tube Coil, Aluminum Fins

NOTE:

The BID SPEC under:

A. Section 2.2.1.1. Air to refrigerant coil; clearly stated to provide COPPER TUBES with COPPER FINS.

B. Section 2.6.2.1. Phenolic Coating; clearly stated to Apply Coating by IMMERSION.

TECHNICAL REPORT

Project name	OOG condensers				
Submitted by	Leo				
Customer	JWS			Date	11/22/2021
OVERVIEW				Quantity	1
System Type	Air-Cooled Split		Refrigerant	R410A	
Series	ACCS		Power supply	208V/3/60HZ	
Unit nomenclature	6ACCS220-QG + 6HE8220D-QG				
Altitude	0 ft		Approval		
FILTER					
Type	Filter 1" 70% Eff				
Size (Qty)	25x20x1(1), 25x25x1(2)				
DX COOLING COIL					
Type	Ø3/8		Number of coil	1	
Rows	3		Face area	13.22	ft²
Fins per Inch	12		Face velocity	408	ft/min
Refrigerant	R410A		Entering air (DB)	80	°F
Capacity (Total)	190397	Btu/h	Entering air (WB)	67	°F
Capacity (Sensible)	134438	Btu/h	Leaving air (DB)	56.8	°F
Air pressure drop	0.3	inH2O	Leaving air (WB)	55.4	°F
COMPRESSOR (OR EQUIVALENT MODELS)					
Compressor				ZP182	
Type	Scroll, Fixed Speed		Quantity	1	
Total LRA	340.0	A	Total Power	15.7	kW
			Total Amps	51	A
FAN (EVAPORATOR)					
Type	Belt Driven		Model	15/15	
Air Flow	5400	CFM	Fan Speed	772	RPM
External Static Pressure	0.5	inH2O	Absorbed Power	1.6	kW
Total Static Pressure	1.2	inH2O	Motor Horsepower	3	HP
Quantity	1		FLA	10.3	A
			Locked rotor current (LRA)	64	A
CONDENSER (AIR COOLED)					
Model	Ø3/8		Motor HP (each)	1	HP
Quantity	1		FLA (each)	2.9	A
Condenser Fan Motor	26" (660MM)		Ambient Temperature	95	°F
Quantity	2				
ELECTRICAL SUMMARY					
Unit FLA	67.1	A	MCA	79.9	A
Total Power Input	18.89	kW	MFS	150	A
EER	10.08		IEER	n/a	

OPTIONS

DESCRIPTION
SV: Suction/Discharge/Liquid Line Service Valves
CU-C: Condenser Coil Fin Materials - Copper
CG: Condenser Coil Guard
DOL2: IEC DOL (Non UL)
MII: Door Interlock Main Incoming Isolator
PFR: UVR/Phase Failure Protect
IR33: Controller - IR33

NOTES

Manufacturer reserves the right to change specifications without prior notice.

SPECIFICATIONS

1 GENERAL

The air-cooled condensing section shall consist of the compressor(s); condenser coil; propeller condenser fan(s) with motor and drive assembly.
The evaporator blower section shall consist of the blower fan and motor assembly; direct expansion coil and a filter frame for flat filters. The units shall be capable to operate up to 115oF [46oC] ambient temperature without failure.

2 CABINET

The unit cabinet shall be constructed from heavy gauge galvanized steel with epoxy painted for excellent finished, weatherability and corrosion resistance up to 1000 hours salt spray test according to ASTM B-117. Evaporator section shall be of 1/2"[13mm] thick x 1 1/2 lb/ft³ [24kg/m³] density (up to model 760) and 1"[25mm] thick x 2 lb/ft³ [32kg/m³] density (model 800 and above) single skin lined with thermal conductivity of 0.0346W/m.K [0.24Btu.in/ft2.h.oF] acoustical fiberglass insulation. The insulation shall have fire resistant of Class O (BS 476 Part 6, 7). Access doors shall be provided for easy service and maintenance of unit internal parts.

3 COMPRESSOR & REFRIGERATION PIPING

Compressor(s) shall be scroll, refrigerant gas cooled and mounted on the base via vibration isolators. 1, 2, 3 or 4 refrigeration circuits shall be piped with copper tubing and include expansion valve with external equalizer, suction accumulator (standard for heat pump models), pressure fittings of manual reset high pressure control and auto reset low pressure safety cutouts as well as charging/access ports in each circuit. Each compressor shall have a crankcase heater installed, properly sized to minimize the amount of liquid refrigerant present in the oil sump during off cycles. The compressors comply with the internationally recognized standards CE and UL.

4 EVAPORATOR COIL

Evaporator coil shall be of draw through air design for uniform air distribution. The evaporator coil shall be quality construction of staggered row of 3/8"OD (model 68 to 570) and 1/2"OD (model 640 and above) seamless copper tube, mechanically bonded to aluminium fins with galvanized coil plates. The coil shall be factory leak and pressure tested to 650psig (45 bar) for R410A system, 450psig (31 bar) for R407C system. A galvanized and painted drain pan shall be provided to cover the entire coil area. The drain pan shall be designed to incorporate sloped gutter for complete condensate removal.

5 EVAPORATOR BLOWER AND MOTOR

Evaporator blower shall be direct-driven (model 68 to 95) and belt driven (model 108 and above), double-inlet-double-width (DIDW) forward curved. All blowers are statically and dynamically balanced to ensure quiet operation and smooth performance. Heavy-duty V-belt fan drive with cast iron pulleys keyed and secured to the blower shaft shall be provided (model 108 and above).
Motors shall be of totally enclosed fan cooled (TEFC) with IP55 enclosure rating, 4-poles with class F insulation. Motors shall be mounted to an adjustable motor frame. Motor pulleys shall be cast iron, keyed and secured to the motor shaft (model 108 and above).

6 CONDENSER COIL

Condenser coil shall be air cooled with integral sub-cooling circuit, constructed from staggered row of 3/8"OD inner grooved seamless copper tube, mechanically bonded to aluminium fins (aluminium coated fin/ hydrophilic fin for heat pump models) with galvanized coil plates. The coil shall be factory leak and pressure tested to 650psig (45 bar) for R410A system, 450psig (31 bar) for R407C system under water.

7 CONDENSER FAN AND MOTOR

Condenser fan shall be direct driven propeller type. Condenser fan motors shall be of totally enclosed air over (TEAO), 6-poles with class F insulation and wired to unit control panel. Condenser fans shall be constructed of corrosion resistant blades and are statically and dynamically balanced (model 68 and above). The condenser fan assembly shall be provided with heavy gauge and rust resistant steel wire fan guard.

8 FILTERS

Evaporator unit shall be provided with 1" thick washable filters having average arrestance efficiency of 70% as per ASHRAE Standard 52.1 (or equivalent).

9 CONTROL PANEL

The unit mounted control panel enclosure shall be constructed from heavy gauge galvanized steel with epoxy painted for excellent finished, weatherability and corrosion resistance. The enclosure shall conform to IP54. Access door shall be provided for easy access and security. The control panel shall be wired without starter and control.

TECHNICAL REPORT

Project name	OOG condensers				
Submitted by	Leo				
Customer	JWS			Date	11/22/2021
OVERVIEW				Quantity	1
System Type	Air-Cooled Split		Refrigerant		R410A
Series	ACCS		Power supply		460V/3/60HZ
Unit nomenclature	6ACCS290-QG + 6EB290D-QG				
Altitude	0	ft	Approval		
FILTER					
Type	Filter 1" 70% Eff				
Size (Qty)	25x16x1(3), 25x20x1(3)				
DX COOLING COIL					
Type	Ø3/8		Number of coil	1	
Rows	3		Face area	16.53	ft²
Fins per inch	12		Face velocity	454	ft/min
Refrigerant	R410A		Entering air (DB)	80	°F
Capacity (Total)	253522	Btu/h	Entering air (WB)	67	°F
Capacity (Sensible)	181867	Btu/h	Leaving air (DB)	57.4	°F
Air pressure drop	0.4	inH2O	Leaving air (WB)	55.9	°F
COMPRESSOR (OR EQUIVALENT MODELS)					
Compressor				2 X ZP122	
Type	Scroll, Fixed Speed		Quantity	2	
Total LRA	280.0	A	Total Power	22.5	kW
			Total Amps	34.3	A
FAN (EVAPORATOR)					
Type	Belt Driven		Model	18/13	
Air Flow	7500	CFM	Fan Speed	693	RPM
External Static Pressure	0.5	inH2O	Absorbed Power	2.9	kW
Total Static Pressure	1.3	inH2O	Motor Horsepower	5.5	HP
Quantity	1		FLA	8.2	A
			Locked rotor current (LRA)	50.5	A
CONDENSER (AIR COOLED)					
Model	Ø3/8		Motor HP (each)	1	HP
Quantity	1		FLA (each)	1.6	A
Condenser Fan Motor	26" (660MM)		Ambient Temperature	95	°F
Quantity	2				
ELECTRICAL SUMMARY					
Unit FLA	45.7	A	MCA	50	A
Total Power Input	27.04	kW	MFS	70	A
EER	9.38		IEER	n/a	

OPTIONS

DESCRIPTION
SV: Suction/Discharge/Liquid Line Service Valves
CU-C: Condenser Coil Fin Materials - Copper
CG: Condenser Coil Guard
DOL2: IEC DOL (Non UL)
MII: Door Interlock Main Incoming Isolator
PFR: UVR/Phase Failure Protect
IR33: Controller - IR33

NOTES

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SPECIFICATIONS

1 GENERAL

The air-cooled condensing section shall consist of the compressor(s); condenser coil; propeller condenser fan(s) with motor and drive assembly.
The evaporator blower section shall consist of the blower fan and motor assembly; direct expansion coil and a filter frame for flat filters. The units shall be capable to operate up to 115oF [46oC] ambient temperature without failure.

2 CABINET

The unit cabinet shall be constructed from heavy gauge galvanized steel with epoxy painted for excellent finished, weatherability and corrosion resistance up to 1000 hours salt spray test according to ASTM B-117. Evaporator section shall be of 1/2"[13mm] thick x 1 1/2 lb/ft³ [24kg/m³] density (up to model 760) and 1"[25mm] thick x 2 lb/ft³ [32kg/m³] density (model 800 and above) single skin lined with thermal conductivity of 0.0346W/m.K [0.24Btu.in/ft2.h.oF] acoustical fiberglass insulation. The insulation shall have fire resistant of Class O (BS 476 Part 6, 7). Access doors shall be provided for easy service and maintenance of unit internal parts.

3 COMPRESSOR & REFRIGERATION PIPING

Compressor(s) shall be scroll, refrigerant gas cooled and mounted on the base via vibration isolators. 1, 2, 3 or 4 refrigeration circuits shall be piped with copper tubing and include expansion valve with external equalizer, suction accumulator (standard for heat pump models), pressure fittings of manual reset high pressure control and auto reset low pressure safety cutouts as well as charging/access ports in each circuit. Each compressor shall have a crankcase heater installed, properly sized to minimize the amount of liquid refrigerant present in the oil sump during off cycles. The compressors comply with the internationally recognized standards CE and UL.

4 EVAPORATOR COIL

Evaporator coil shall be of draw through air design for uniform air distribution. The evaporator coil shall be quality construction of staggered row of 3/8"OD (model 68 to 570) and 1/2"OD (model 640 and above) seamless copper tube, mechanically bonded to aluminium fins with galvanized coil plates. The coil shall be factory leak and pressure tested to 650psig (45 bar) for R410A system, 450psig (31 bar) for R407C system. A galvanized and painted drain pan shall be provided to cover the entire coil area. The drain pan shall be designed to incorporate sloped gutter for complete condensate removal.

5 EVAPORATOR BLOWER AND MOTOR

Evaporator blower shall be direct-driven (model 68 to 95) and belt driven (model 108 and above), double-inlet-double-width (DIDW) forward curved. All blowers are statically and dynamically balanced to ensure quiet operation and smooth performance. Heavy-duty V-belt fan drive with cast iron pulleys keyed and secured to the blower shaft shall be provided (model 108 and above).
Motors shall be of totally enclosed fan cooled (TEFC) with IP55 enclosure rating, 4-poles with class F insulation. Motors shall be mounted to an adjustable motor frame. Motor pulleys shall be cast iron, keyed and secured to the motor shaft (model 108 and above).

6 CONDENSER COIL

Condenser coil shall be air cooled with integral sub-cooling circuit, constructed from staggered row of 3/8"OD inner grooved seamless copper tube, mechanically bonded to aluminium fins (aluminium coated fin/ hydrophilic fin for heat pump models) with galvanized coil plates. The coil shall be factory leak and pressure tested to 650psig (45 bar) for R410A system, 450psig (31 bar) for R407C system under water.

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Condenser fan shall be direct driven propeller type. Condenser fan motors shall be of totally enclosed air over (TEAO), 6-poles with class F insulation and wired to unit control panel. Condenser fans shall be constructed of corrosion resistant blades and are statically and dynamically balanced (model 68 and above). The condenser fan assembly shall be provided with heavy gauge and rust resistant steel wire fan guard.

8 FILTERS

Evaporator unit shall be provided with 1" thick washable filters having average arrestance efficiency of 70% as per ASHRAE Standard 52.1 (or equivalent).

9 CONTROL PANEL

The unit mounted control panel enclosure shall be constructed from heavy gauge galvanized steel with epoxy painted for excellent finished, weatherability and corrosion resistance. The enclosure shall conform to IP54. Access door shall be provided for easy access and security. The control panel shall be wired without starter and control.

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Unit nomenclature	6ACCS290-QG + 6E8290D-QG				
Altitude	0	ft	Approval		
FILTER					
Type	Filter 1" 70% Eff				
Size (Qty)	25x16x1(3), 25x20x1(3)				
DX COOLING COIL					
Type	Ø3/8		Number of coil	1	
Rows	3		Face area	16.53	ft²
Fins per inch	12		Face velocity	454	ft/min
Refrigerant	R410A		Entering air (DB)	80	°F
Capacity (Total)	249769	Btu/h	Entering air (WB)	67	°F
Capacity (Sensible)	180502	Btu/h	Leaving air (DB)	57.6	°F
Air pressure drop	0.4	inH2O	Leaving air (WB)	56.1	°F
COMPRESSOR (OR EQUIVALENT MODELS)					
Compressor				2 X ZP122	
Type	Scroll, Fixed Speed		Quantity	2	
Total LRA	480.0	A	Total Power	22.9	kW
			Total Amps	63.7	A
FAN (EVAPORATOR)					
Type	Belt Driven		Model	18/13	
Air Flow	7500	CFM	Fan Speed	693	RPM
External Static Pressure	0.5	inH2O	Absorbed Power	2.9	kW
Total Static Pressure	1.3	inH2O	Motor Horsepower	5.5	HP
Quantity	1		FLA	18.1	A
			Locked rotor current (LRA)	112	A
CONDENSER (AIR COOLED)					
Model	Ø3/8		Motor HP (each)	1	HP
Quantity	1		FLA (each)	2.9	A
Condenser Fan Motor	26" (660MM)		Ambient Temperature	95	°F
Quantity	2				
ELECTRICAL SUMMARY					
Unit FLA	87.6	A	MCA	95.9	A
Total Power Input	27.3	kW	MFS	150	A
EER	9.15		IEER	n/a	

OPTIONS

DESCRIPTION

SV: Suction/Discharge/Liquid Line Service Valves
CU-C: Condenser Coil Fin Materials - Copper
SSD: Stainless Steel Drain Pan
CG: Condenser Coil Guard
OOL2: IEC OOL (Non UL)
MII: Door Interlock Main Incoming Isolator
PFR: UVR/Phase Failure Protect
IR33: Controller - IR33

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2 CABINET

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3 COMPRESSOR & REFRIGERATION PIPING

Compressor(s) shall be scroll, refrigerant gas cooled and mounted on the base via vibration isolators. 1, 2, 3 or 4 refrigeration circuits shall be piped with copper tubing and include expansion valve with external equalizer, suction accumulator (standard for heat pump models), pressure fittings of manual reset high pressure control and auto reset low pressure safety cutouts as well as charging/access ports in each circuit. Each compressor shall have a crankcase heater installed, properly sized to minimize the amount of liquid refrigerant present in the oil sump during off cycles. The compressors comply with the internationally recognized standards CE and UL.

4 EVAPORATOR COIL

Evaporator coil shall be of draw through air design for uniform air distribution. The evaporator coil shall be quality construction of staggered row of 3/8"OD (model 68 to 570) and 1/2"OD (model 640 and above) seamless copper tube, mechanically bonded to aluminium fins with galvanized coil plates. The coil shall be factory leak and pressure tested to 650psig (45 bar) for R410A system, 450psig (31 bar) for R407C system. A galvanized and painted drain pan shall be provided to cover the entire coil area. The drain pan shall be designed to incorporate sloped gutter for complete condensate removal.

5 EVAPORATOR BLOWER AND MOTOR

Evaporator blower shall be direct-driven (model 68 to 95) and belt driven (model 108 and above), double-inlet-double-width (DIDW) forward curved. All blowers are statically and dynamically balanced to ensure quiet operation and smooth performance. Heavy-duty V-belt fan drive with cast iron pulleys keyed and secured to the blower shaft shall be provided (model 108 and above).
Motors shall be of totally enclosed fan cooled (TEFC) with IP55 enclosure rating, 4-poles with class F insulation. Motors shall be mounted to an adjustable motor frame. Motor pulleys shall be cast iron, keyed and secured to the motor shaft (model 108 and above).

6 CONDENSER COIL

Condenser coil shall be air cooled with integral sub-cooling circuit, constructed from staggered row of 3/8"OD inner grooved seamless copper tube, mechanically bonded to aluminium fins (aluminium coated fin/ hydrophilic fin for heat pump models) with galvanized coil plates. The coil shall be factory leak and pressure tested to 650psig (45 bar) for R410A system, 450psig (31 bar) for R407C system under water.

7 CONDENSER FAN AND MOTOR

Condenser fan shall be direct driven propeller type. Condenser fan motors shall be of totally enclosed air over (TEAO), 6-poles with class F insulation and wired to unit control panel. Condenser fans shall be constructed of corrosion resistant blades and are statically and dynamically balanced (model 68 and above). The condenser fan assembly shall be provided with heavy gauge and rust resistant steel wire fan guard.

8 FILTERS

Evaporator unit shall be provided with 1" thick washable filters having average arrestance efficiency of 70% as per ASHRAE Standard 52.1 (or equivalent).

9 CONTROL PANEL

The unit mounted control panel enclosure shall be constructed from heavy gauge galvanized steel with epoxy painted for excellent finished, weatherability and corrosion resistance. The enclosure shall conform to IP54. Access door shall be provided for easy access and security. The control panel shall be wired without starter and control.

TECHNICAL REPORT

Project name	OOG condensers				
Submitted by	Leo				
Customer	JWS			Date	11/22/2021
				Quantity	1
OVERVIEW					
System Type	Air-Cooled Split		Refrigerant	R410A	
Series	ACCS		Power supply	460V/3/60HZ	
Unit nomenclature	6ACCS435-QG + 6EB435D-QG				
Altitude	0	ft	Approval		
FILTER					
Type	Filter 1" 70% Eff				
Size (Qty)	20x25x1(3), 25x25x1(3)				
DX COOLING COIL					
Type	Ø3/8		Number of coil	1	
Rows	3		Face area	21.39	ft²
Fins per inch	13		Face velocity	538	ft/min
Refrigerant	R410A		Entering air (DB)	80	°F
Capacity (Total)	377724	Btu/h	Entering air (WB)	67	°F
Capacity (Sensible)	274677	Btu/h	Leaving air (DB)	57.7	°F
Air pressure drop	0.5	InH2O	Leaving air (WB)	56.3	°F
COMPRESSOR (OR EQUIVALENT MODELS)					
Compressor					
Type	Scroll, Fixed Speed		Quantity	2 X ZP182	
Total LRA	358.0	A	Total Power	2	
			Total Amps	31.2	kW
FAN (EVAPORATOR)				50.6	A
Type	Belt Driven		Model	450	
Air Flow	11500	CFM	Fan Speed	763	RPM
External Static Pressure	0.5	InH2O	Absorbed Power	5.4	kW
Total Static Pressure	1.4	InH2O	Motor Horsepower	10	HP
Quantity	1		FLA	14.4	A
			Locked rotor current (LRA)	85.7	A
CONDENSER (AIR COOLED)					
Model	Ø3/8		Motor HP (each)	1	HP
Quantity	1		FLA (each)	1.6	A
Condenser Fan Motor	26" (660MM)		Ambient Temperature	95	°F
Quantity	3				
ELECTRICAL SUMMARY					
Unit FLA	69.8	A	MCA	70.1	A
Total Power Input	39.02	kW	MFS	125	A
EER	9.68		IEER	n/a	
OPTIONS					
DESCRIPTION					
SV: Suction/Discharge/Liquid Line Service Valves					
CU-C: Condenser Coil Fin Materials - Copper					
CG: Condenser Coil Guard					
DOL2: IEC DOL (Non UL)					
MII: Door Interlock Main Incoming Isolator					
PFR: UVR/Phase Failure Protect					
IR33: Controller - IR33					
NOTES					
Manufacturer reserves the right to change specificotions without prior notice.					

SPECIFICATIONS

1 GENERAL

The air-cooled condensing section shall consist of the compressor(s), condenser coil, propeller condenser fan(s) with motor and drive assembly.
The evaporator blower section shall consist of the blower fan and motor assembly; direct expansion coil and a filter frame for flat filters. The units shall be capable to operate up to 115oF [46oC] ambient temperature without failure.

2 CABINET

The unit cabinet shall be constructed from heavy gauge galvanized steel with epoxy painted for excellent finished, weatherability and corrosion resistance up to 1000 hours salt spray test according to ASTM B-117. Evaporator section shall be of 1/2"[13mm] thick x 1 1/2 lb/ft³ [24kg/m³] density (up to model 760) and 1"[25mm] thick x 2 lb/ft³ [32kg/m³] density (model 800 and above) single skin lined with thermal conductivity of 0.0346W/m.K [0.24Btu.in/ft2.h.oF] acoustical fiberglass insulation. The insulation shall have fire resistant of Class O (BS 476 Part 6, 7). Access doors shall be provided for easy service and maintenance of unit internal parts.

3 COMPRESSOR & REFRIGERATION PIPING

Compressor(s) shall be scroll, refrigerant gas cooled and mounted on the base via vibration isolators. 1, 2, 3 or 4 refrigeration circuits shall be piped with copper tubing and include expansion valve with external equalizer, suction accumulator (standard for heat pump models), pressure fittings of manual reset high pressure control and auto reset low pressure safety cutouts as well as charging/access ports in each circuit. Each compressor shall have a crankcase heater installed, properly sized to minimize the amount of liquid refrigerant present in the oil sump during off cycles. The compressors comply with the internationally recognized standards CE and UL.

4 EVAPORATOR COIL

Evaporator coil shall be of draw through air design for uniform air distribution. The evaporator coil shall be quality construction of staggered row of 3/8"OD (model 68 to 570) and 1/2"OD (model 640 and above) seamless copper tube, mechanically bonded to aluminium fins with galvanized coil plates. The coil shall be factory leak and pressure tested to 650psig (45 bar) for R410A system, 450psig (31 bar) for R407C system. A galvanized and painted drain pan shall be provided to cover the entire coil area. The drain pan shall be designed to incorporate sloped gutter for complete condensate removal.

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Motors shall be of totally enclosed fan cooled (TEFC) with IP55 enclosure rating, 4-poles with class F insulation. Motors shall be mounted to an adjustable motor frame. Motor pulleys shall be cast iron, keyed and secured to the motor shaft (model 108 and above).

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Condenser coil shall be air cooled with integral sub-cooling circuit, constructed from staggered row of 3/8"OD inner grooved seamless copper tube, mechanically bonded to aluminium fins (aluminium coated fin/ hydrophilic fin for heat pump models) with galvanized coil plates. The coil shall be factory leak and pressure tested to 650psig (45 bar) for R410A system, 450psig (31 bar) for R407C system under water.

7 CONDENSER FAN AND MOTOR

Condenser fan shall be direct driven propeller type. Condenser fan motors shall be of totally enclosed air over (TEAO), 6-poles with class F insulation and wired to unit control panel. Condenser fans shall be constructed of corrosion resistant blades and are statically and dynamically balanced (model 68 and above). The condenser fan assembly shall be provided with heavy gauge and rust resistant steel wire fan guard.

8 FILTERS

Evaporator unit shall be provided with 1" thick washable filters having average arrestance efficiency of 70% as per ASHRAE Standard 52.1 (or equivalent).

9 CONTROL PANEL

The unit mounted control panel enclosure shall be constructed from heavy gauge galvanized steel with epoxy painted for excellent finished, weatherability and corrosion resistance. The enclosure shall conform to IP54. Access door shall be provided for easy access and security. The control panel shall be wired without starter and control.

TECHNICAL REPORT

Project name	OOG condensers				
Submitted by	Leo			Date	11/22/2021
Customer	JWS			Quantity	1
OVERVIEW					
System Type	Air-Cooled Split		Refrigerant	R410A	
Series	ACCS		Power supply	208V/3/60HZ	
Unit nomenclature	6ACCS435-QG + 6EB43SD-QG				
Altitude	0 ft		Approval		
FILTER					
Type	Filter 1" 70% Eff				
Size (Qty)	20x25x1(3), 25x25x1(3)				
DX COOLING COIL					
Type	Ø3/8		Number of coil	1	
Rows	3		Face area	21.39	ft²
Fins per inch	13		Face velocity	538	ft/min
Refrigerant	R410A		Entering air (DB)	80	°F
Capacity (Total)	376700	Btu/h	Entering air (WB)	67	°F
Capacity (Sensible)	273995	Btu/h	Leaving air (DB)	57.7	°F
Air pressure drop	0.5	inH2O	Leaving air (WB)	56.3	°F
COMPRESSOR (OR EQUIVALENT MODELS)					
Compressor				2 X ZP182	
Type	Scroll, Fixed Speed		Quantity	2	
Total LRA	680.0	A	Total Power	32.1	kW
			Total Amps	103.6	A
FAN (EVAPORATOR)					
Type	Belt Driven		Model	450	
Air Flow	11500	CFM	Fan Speed	762	RPM
External Static Pressure	0.5	inH2O	Absorbed Power	5.4	kW
Total Static Pressure	1.4	inH2O	Motor Horsepower	10	HP
Quantity	1		FLA	31.8	A
			Locked rotor current (LRA)	190.1	A
CONDENSER (AIR COOLED)					
Model	Ø3/8		Motor HP (each)	1	HP
Quantity	1		FLA (each)	2.9	A
Condenser Fan Motor	26" (660MM)		Ambient Temperature	95	°F
Quantity	3				
ELECTRICAL SUMMARY					
Unit FLA	144.1	A	MCA	157	A
Total Power Input	39.8	kW	MFS	225	A
EER	9.47		IEER	n/a	

OPTIONS

DESCRIPTION

- SV: Suction/Discharge/Liquid Line Service Valves
- CU-C: Condenser Coil Fin Materials - Copper
- CG: Condenser Coil Guard
- DOL2: IEC DOL (Non UL)
- MII: Door Interlock Main Incoming Isolator
- PFR: UVR/Phase Failure Protect
- IR33: Controller - IR33

NOTES

Manufacturer reserves the right to change specifications without prior notice.

SPECIFICATIONS

1 GENERAL

The air-cooled condensing section shall consist of the compressor(s); condenser coil, propeller condenser fan(s) with motor and drive assembly.
The evaporator blower section shall consist of the blower fan and motor assembly, direct expansion coil and a filter frame for flat filters. The units shall be capable to operate up to 115oF [46oC] ambient temperature without failure.

2 CABINET

The unit cabinet shall be constructed from heavy gauge galvanized steel with epoxy painted for excellent finished, weatherability and corrosion resistance up to 1000 hours salt spray test according to ASTM B-117. Evaporator section shall be of 1/2"[13mm] thick x 1 1/2 lb/ft³ [24kg/m³] density (up to model 760) and 1"[25mm] thick x 2 lb/ft³ [32kg/m³] density (model 800 and above) single skin lined with thermal conductivity of 0.0346W/m.K (0.24Btu.in/ft2.h.oF] acoustical fiberglass insulation. The insulation shall have fire resistant of Class O (BS 476 Part 6, 7). Access doors shall be provided for easy service and maintenance of unit internal parts.

3 COMPRESSOR & REFRIGERATION PIPING

Compressor(s) shall be scroll, refrigerant gas cooled and mounted on the base via vibration isolators. 1, 2, 3 or 4 refrigeration circuits shall be piped with copper tubing and include expansion valve with external equalizer, suction accumulator (standard for heat pump models), pressure fittings of manual reset high pressure control and auto reset low pressure safety cutouts as well as charging/access ports in each circuit. Each compressor shall have a crankcase heater installed, properly sized to minimize the amount of liquid refrigerant present in the oil sump during off cycles The compressors comply with the internationally recognized standards CE and UL.

4 EVAPORATOR COIL

Evaporator coil shall be of draw through air design for uniform air distribution. The evaporator coil shall be quality construction of staggered row of 3/8"OD (model 68 to 570) and 1/2"OD (model 640 and above) seamless copper tube, mechanically bonded to aluminium fins with galvanized coil plates. The coil shall be factory leak and pressure tested to 650psig (45 bar) for R410A system, 450psig (31 bar) for R407C system. A galvanized and painted drain pan shall be provided to cover the entire coil area. The drain pan shall be designed to incorporate sloped gutter for complete condensate removal.

5 EVAPORATOR BLOWER AND MOTOR

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Motors shall be of totally enclosed fan cooled (TEFC) with IP55 enclosure rating, 4-poles with class F insulation. Motors shall be mounted to an adjustable motor frame. Motor pulleys shall be cast iron, keyed and secured to the motor shaft (model 108 and above).

6 CONDENSER COIL

Condenser coil shall be air cooled with integral sub-cooling circuit, constructed from staggered row of 3/8"OD inner grooved seamless copper tube, mechanically bonded to aluminium fins (aluminium coated fin/ hydrophilic fin for heat pump models) with galvanized coil plates. The coil shall be factory leak and pressure tested to 650psig (45 bar) for R410A system, 450psig (31 bar) for R407C system under water.

7 CONDENSER FAN AND MOTOR

Condenser fan shall be direct driven propeller type. Condenser fan motors shall be of totally enclosed air over (TEAO), 6-poles with class F insulation and wired to unit control panel. Condenser fans shall be constructed of corrosion resistant blades and are statically and dynamically balanced (model 68 and above). The condenser fan assembly shall be provided with heavy gauge and rust resistant steel wire fan guard.

8 FILTERS

Evaporator unit shall be provided with 1" thick washable filters having average arrestance efficiency of 70% as per ASHRAE Standard 52.1 (or equivalent).

9 CONTROL PANEL

The unit mounted control panel enclosure shall be constructed from heavy gauge galvanized steel with epoxy painted for excellent finished, weatherability and corrosion resistance. The enclosure shall conform to IP54. Access door shall be provided for easy access and security. The control panel shall be wired without starter and control.

TECHNICAL REPORT

Project name	OOG condensers				
Submitted by	Leo			Date	11/22/2021
Customer	JWS			Quantity	1
OVERVIEW					
System Type	Air-Cooled Split		Refrigerant	R410A	
Series	ACCS		Power supply	208V/3/60HZ	
Unit nomenclature	6ACCS570-QG + 6EB570D-QG				
Altitude	0	ft	Approval		
FILTER					
Type	Filter 1" 70% Eff				
Size (Qty)	20x25x1(9)				
DX COOLING COIL					
Type	Ø3/8		Number of coil	1	
Rows	3		Face area	29.17	ft²
Fins per inch	12		Face velocity	514	ft/min
Refrigerant	R410A		Entering air (DB)	80	°F
Capacity (Total)	497149	Btu/h	Entering air (WB)	67	°F
Capacity (Sensible)	357934	Btu/h	Leaving air (DB)	57.7	°F
Air pressure drop	0.5	InH2O	Leaving air (WB)	56.3	°F
COMPRESSOR (OR EQUIVALENT MODELS)					
Compressor					
Type	Scroll, Fixed Speed		Quantity	2 X ZP154 + ZP182	
Total LRA	2x300 1x340	A	Total Power	3	
			Total Amps	44.2	kW
				137.4	A
FAN (EVAPORATOR)					
Type	Belt Driven		Model	500	
Air Flow	15000	CFM	Fan Speed	727	RPM
External Static Pressure	0.5	InH2O	Absorbed Power	7.2	kW
Total Static Pressure	1.4	InH2O	Motor Horsepower	15	HP
Quantity	1		FLA	44.2	A
			Locked rotor current (LRA)	286.1	A
CONDENSER (AIR COOLED)					
Model	Ø3/8		Motor HP (each)	1	HP
Quantity	1		FLA (each)	2.9	A
Condenser Fan Motor	26" (660MM)		Ambient Temperature	95	°F
Quantity	4				
ELECTRICAL SUMMARY					
Unit FLA	193.2	A	MCA	206.2	A
Total Power Input	54.42	kW	MFS	300	A
EER	9.14		IEER	n/a	
OPTIONS					
DESCRIPTION					
SV: Suction/Discharge/Liquid Line Service Valves					
CU-C: Condenser Coil Fin Materials - Copper					
CG: Condenser Coil Guard					
DOL2: IEC DOL (Non UL)					
MII: Door Interlock Main Incoming Isolator					
PFR: UVR/Phase Failure Protect					
IR33: Controller - IR33					
NOTES					
Manufacturer reserves the right to change specifications without prior notice.					

SPECIFICATIONS

1 GENERAL

The air-cooled condensing section shall consist of the compressor(s); condenser coil; propeller condenser fan(s) with motor and drive assembly.
The evaporator blower section shall consist of the blower fan and motor assembly; direct expansion coil and a filter frame for flat filters. The units shall be capable to operate up to 115oF [46oC] ambient temperature without failure.

2 CABINET

The unit cabinet shall be constructed from heavy gauge galvanized steel with epoxy painted for excellent finished, weatherability and corrosion resistance up to 1000 hours salt spray test according to ASTM B-117. Evaporator section shall be of 1/2"[13mm] thick x 1 1/2 lb/ft³ [24kg/m³] density (up to model 760) and 1"[25mm] thick x 2 lb/ft³ [32kg/m³] density (model 800 and above) single skin lined with thermal conductivity of 0.0346W/m.K [0.24Btu.in/ft2.h.oF] acoustical fiberglass insulation. The insulation shall have fire resistant of Class O (BS 476 Part 6, 7). Access doors shall be provided for easy service and maintenance of unit internal parts.

3 COMPRESSOR & REFRIGERATION PIPING

Compressor(s) shall be scroll, refrigerant gas cooled and mounted on the base via vibration isolators. 1, 2, 3 or 4 refrigeration circuits shall be piped with copper tubing and include expansion valve with external equalizer, suction accumulator (standard for heat pump models), pressure fittings of manual reset high pressure control and auto reset low pressure safety cutouts as well as charging/access ports in each circuit. Each compressor shall have a crankcase heater installed, properly sized to minimize the amount of liquid refrigerant present in the oil sump during off cycles. The compressors comply with the internationally recognized standards CE and UL.

4 EVAPORATOR COIL

Evaporator coil shall be of draw through air design for uniform air distribution. The evaporator coil shall be quality construction of staggered row of 3/8"OD (model 68 to 570) and 1/2"OD (model 640 and above) seamless copper tube, mechanically bonded to aluminium fins with galvanized coil plates. The coil shall be factory leak and pressure tested to 650psig (45 bar) for R410A system, 450psig (31 bar) for R407C system. A galvanized and painted drain pan shall be provided to cover the entire coil area. The drain pan shall be designed to incorporate sloped gutter for complete condensate removal.

5 EVAPORATOR BLOWER AND MOTOR

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Motors shall be of totally enclosed fan cooled (TEFC) with IP55 enclosure rating, 4-poles with class F insulation. Motors shall be mounted to an adjustable motor frame. Motor pulleys shall be cast iron, keyed and secured to the motor shaft (model 108 and above).

6 CONDENSER COIL

Condenser coil shall be air cooled with integral sub-cooling circuit, constructed from staggered row of 3/8"OD inner grooved seamless copper tube, mechanically bonded to aluminium fins (aluminium coated fin/ hydrophilic fin for heat pump models) with galvanized coil plates. The coil shall be factory leak and pressure tested to 650psig (45 bar) for R410A system, 450psig (31 bar) for R407C system under water.

7 CONDENSER FAN AND MOTOR

Condenser fan shall be direct driven propeller type. Condenser fan motors shall be of totally enclosed air over (TEAO), 6-poles with class F insulation and wired to unit control panel. Condenser fans shall be constructed of corrosion resistant blades and are statically and dynamically balanced (model 68 and above). The condenser fan assembly shall be provided with heavy gauge and rust resistant steel wire fan guard.

8 FILTERS

Evaporator unit shall be provided with 1" thick washable filters having average arrestance efficiency of 70% as per ASHRAE Standard 52.1 (or equivalent).

9 CONTROL PANEL

The unit mounted control panel enclosure shall be constructed from heavy gauge galvanized steel with epoxy painted for excellent finished, weatherability and corrosion resistance. The enclosure shall conform to IP54. Access door shall be provided for easy access and security. The control panel shall be wired without starter and control.

TECHNICAL REPORT

Project name	OOG condensers				
Submitted by	Leo			Date	11/22/2021
Customer	JWS			Quantity	1
OVERVIEW					
System Type	Air-Cooled Split		Refrigerant	R410A	
Series	ACCS		Power supply	460V/3/60HZ	
Unit nomenclature	6ACCS700-QG + 6EB700D-QG				
Altitude	0 ft		Approval		
FILTER					
Type	Filter 1" 70% Eff				
Size (Qty)	20x25x1(3), 25x25x1(6)				
DX COOLING COIL					
Type	Ø1/2		Number of coil	1	
Rows	4		Face area	34.03	ft²
Fins per inch	10		Face velocity	505	ft/min
Refrigerant	R410A		Entering air (DB)	80	°F
Capacity (Total)	640800	Btu/h	Entering air (WB)	67	°F
Capacity (Sensible)	442555	Btu/h	Leaving air (DB)	55.9	°F
Air pressure drop	0.6	InH2O	Leaving air (WB)	54.7	°F
COMPRESSOR (OR EQUIVALENT MODELS)					
Compressor					
Type	Scroll, Fixed Speed		Quantity	2 X ZP154 TDM	
Total LRA	600.0	A	Total Power	4	
			Total Amps	49.8	kW
				74.9	A
FAN (EVAPORATOR)					
Type	Belt Driven		Model	560	
Air Flow	17200	CFM	Fan Speed	630	RPM
External Static Pressure	0.5	InH2O	Absorbed Power	7.2	kW
Total Static Pressure	1.5	InH2O	Motor Horsepower	15	HP
Quantity	1		FLA	19.9	A
			Locked rotor current (LRA)	129.1	A
CONDENSER (AIR COOLED)					
Model	Ø3/8		Motor HP (each)	2 2/3	HP
Quantity	1		FLA (each)	4	A
Condenser Fan Motor	800MM		Ambient Temperature	95	°F
Quantity	3				
ELECTRICAL SUMMARY					
Unit FLA	106.8	A	MCA	111.5	A
Total Power Input	63.68	kW	MFS	150	A
EER	10.06		IEER	n/a	

OPTIONS

DESCRIPTION
SV: Suction/Discharge/Liquid Line Service Valves
CU-C: Condenser Coil Fin Materials - Copper
CG: Condenser Coil Guard
OOL2: IEC DOL (Non UL)
MII: Door Interlock Main Incoming Isolator
PFR: UVR/Phase Failure Protect
IR33: Controller - IR33

NOTES

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SPECIFICATIONS

1 GENERAL

The air-cooled condensing section shall consist of the compressor(s): condenser coil; propeller condenser fan(s) with motor and drive assembly.
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2 CABINET

The unit cabinet shall be constructed from heavy gauge galvanized steel with epoxy painted for excellent finished, weatherability and corrosion resistance up to 1000 hours salt spray test according to ASTM B-117. Evaporator section shall be of 1/2"[13mm] thick x 1 1/2 lb/ft³ [24kg/m³] density (up to model 760) and 1"[25mm] thick x 2 lb/ft³ [32kg/m³] density (model 800 and above) single skin lined with thermal conductivity of 0.0346W/m.K [0.24Btu.in/ft2.h.oF] acoustical fiberglass insulation. The insulation shall have fire resistant of Class O (BS 476 Part 6, 7). Access doors shall be provided for easy service and maintenance of unit internal parts.

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Condenser fan shall be direct driven propeller type. Condenser fan motors shall be of totally enclosed air over (TEAO), 6-poles with class F insulation and wired to unit control panel. Condenser fans shall be constructed of corrosion resistant blades and are statically and dynamically balanced (model 68 and above). The condenser fan assembly shall be provided with heavy gauge and rust resistant steel wire fan guard.

8 FILTERS

Evaporator unit shall be provided with 1" thick washable filters having average arrestance efficiency of 70% as per ASHRAE Standard 52.1 (or equivalent).

9 CONTROL PANEL

The unit mounted control panel enclosure shall be constructed from heavy gauge galvanized steel with epoxy painted for excellent finished, weatherability and corrosion resistance. The enclosure shall conform to IP54. Access door shall be provided for easy access and security. The control panel shall be wired without starter and control.

TECHNICAL REPORT

Project name	OOG condensers				
Submitted by	Leo			Date	11/22/2021
Customer	JWS			Quantity	1
OVERVIEW					
System Type	Air-Cooled Split		Refrigerant	R410A	
Series	ACCS		Power supply	208V/3/60Hz	
Unit nomenclature	6ACCS700-QG + 6E8700D-QG				
Altitude	0	ft	Approval		
FILTER					
Type	Filter 1" 70% Eff				
Size (Qty)	20x25x1(3), 25x25x1(6)				
DX COOLING COIL					
Type	Ø1/2		Number of coil	1	
Rows	4		Face area	34.03	ft²
Fins per inch	10		Face velocity	505	ft/min
Refrigerant	R410A		Entering air (DB)	80	°F
Capacity (Total)	639094	Btu/h	Entering air (WB)	67	°F
Capacity (Sensible)	441872	Btu/h	Leaving air (DB)	56.1	°F
Air pressure drop	0.6	inH2O	Leaving air (WB)	54.7	°F
COMPRESSOR (OR EQUIVALENT MODELS)					
Compressor				2 X ZP154 TDM	
Type	Scroll, Fixed Speed		Quantity	4	
Total LRA	1200.0	A	Total Power	51.8	kW
			Total Amps	161.3	A
FAN (EVAPORATOR)					
Type	Belt Driven		Model	560	
Air Flow	17200	CFM	Fan Speed	630	RPM
External Static Pressure	0.5	inH2O	Absorbed Power	7.2	kW
Total Static Pressure	1.5	inH2O	Motor Horsepower	15	HP
Quantity	1		FLA	44.2	A
			Locked rotor current (LRA)	286.1	A
CONDENSER (AIR COOLED)					
Model	Ø3/8		Motor HP (each)	2 2/3	HP
Quantity	1		FLA (each)	7.5	A
Condenser Fan Motor	800MM		Ambient Temperature	95	°F
Quantity	3				
ELECTRICAL SUMMARY					
Unit FLA	228	A	MCA	238.1	A
Total Power Input	65.26	kW	MFS	300	A
EER	9.79		IEER	n/a	

OPTIONS

DESCRIPTION

- SV: Suction/Discharge/Liquid Line Service Valves
- CU-C: Condenser Coil Fin Materials - Copper
- CG: Condenser Coil Guard
- DOL2: IEC DOL (Non UL)
- MI: Door Interlock Main Incoming Isolator
- PFR: UVR/Phase Failure Protect
- IR33: Controller - IR33

NOTES

Manufacturer reserves the right to change specifications without prior notice.

SPECIFICATIONS

1 GENERAL

The air-cooled condensing section shall consist of the compressor(s); condenser coil; propeller condenser fan(s) with motor and drive assembly.
The evaporator blower section shall consist of the blower fan and motor assembly; direct expansion coil and a filter frame for flat filters. The units shall be capable to operate up to 115oF [46oC] ambient temperature without failure.

2 CABINET

The unit cabinet shall be constructed from heavy gauge galvanized steel with epoxy painted for excellent finished, weatherability and corrosion resistance up to 1000 hours salt spray test according to ASTM B-117. Evaporator section shall be of 1/2"[13mm] thick x 1 1/2 lb/ft³ [24kg/m³] density (up to model 760) and 1"(25mm] thick x 2 lb/ft³ [32kg/m³] density (model 800 and above) single skin lined with thermal conductivity of 0.0346W/m.K [0.24Btu.in/ft2.h.oF] acoustical fiberglass insulation. The insulation shall have fire resistant of Class O (BS 476 Part 6, 7). Access doors shall be provided for easy service and maintenance of unit internal parts.

3 COMPRESSOR & REFRIGERATION PIPING

Compressor(s) shall be scroll, refrigerant gas cooled and mounted on the base via vibration isolators. 1, 2, 3 or 4 refrigeration circuits shall be piped with copper tubing and include expansion valve with external equalizer, suction accumulator (standard for heat pump models), pressure fittings of manual reset high pressure control and auto reset low pressure safety cutouts as well as charging/access ports in each circuit. Each compressor shall have a crankcase heater installed, properly sized to minimize the amount of liquid refrigerant present in the oil sump during off cycles. The compressors comply with the internationally recognized standards CE and UL.

4 EVAPORATOR COIL

Evaporator coil shall be of draw through air design for uniform air distribution. The evaporator coil shall be quality construction of staggered row of 3/8"OD (model 68 to 570) and 1/2"OD (model 640 and above) seamless copper tube, mechanically bonded to aluminium fins with galvanized coil plates. The coil shall be factory leak and pressure tested to 650psig (45 bar) for R410A system, 450psig (31 bar) for R407C system. A galvanized and painted drain pan shall be provided to cover the entire coil area. The drain pan shall be designed to incorporate sloped gutter for complete condensate removal.

5 EVAPORATOR BLOWER AND MOTOR

Evaporator blower shall be direct-driven (model 68 to 95) and belt driven (model 108 and above), double-inlet-double-width (DIDW) forward curved. All blowers are statically and dynamically balanced to ensure quiet operation and smooth performance. Heavy-duty V-belt fan drive with cast iron pulleys keyed and secured to the blower shaft shall be provided (model 108 and above).
Motors shall be of totally enclosed fan cooled (TEFC) with IP55 enclosure rating, 4-poles with class F insulation. Motors shall be mounted to an adjustable motor frame. Motor pulleys shall be cast iron, keyed and secured to the motor shaft (model 108 and above).

6 CONDENSER COIL

Condenser coil shall be air cooled with integral sub-cooling circuit, constructed from staggered row of 3/8"OD inner grooved seamless copper tube, mechanically bonded to aluminium fins (aluminium coated fin/ hydrophilic fin for heat pump models) with galvanized coil plates. The coil shall be factory leak and pressure tested to 650psig (45 bar) for R410A system, 450psig (31 bar) for R407C system under water.

7 CONDENSER FAN AND MOTOR

Condenser fan shall be direct driven propeller type. Condenser fan motors shall be of totally enclosed air over (TEAO), 6-poles with class F insulation and wired to unit control panel. Condenser fans shall be constructed of corrosion resistant blades and are statically and dynamically balanced (model 68 and above). The condenser fan assembly shall be provided with heavy gauge and rust resistant steel wire fan guard.

8 FILTERS

Evaporator unit shall be provided with 1" thick washable filters having average arrestance efficiency of 70% as per ASHRAE Standard 52.1 (or equivalent).

9 CONTROL PANEL

The unit mounted control panel enclosure shall be constructed from heavy gauge galvanized steel with epoxy painted for excellent finished, weatherability and corrosion resistance. The enclosure shall conform to IP54. Access door shall be provided for easy access and security. The control panel shall be wired without starter and control.

EXHIBIT 10

EXHIBIT 10-1

Johnson Controls

SUBMITTAL DATA

Order #: **Date:** 03/15/2022

Project: University of Guam

Project #:

Submitter: Norberto Tiru
GUAM MICROTECH CORPORATION
#4 C&S Building,
Dededo, Guam 96929
671-989-0100

Date
03/15/2022
Project Name
University of Guam
Project Number
Client / Purchaser

Johnson Controls

Submittal Summary Page

Qty	Tag #	Model # / Material #	Description
1	ACCU-1	YD600C00A4GEB2	50 Ton, York Split System R-410A Air Conditioner, 4-Pipe, Four Stage Cooling, 460-3-60 • HACR Circuit Breaker/Disconnect • Electrofin Copper Tube/Copper Fin Condenser Coil • Phase Monitor • Smart Equipment Controller with Gateway to BACnet MS/TP (Programmable to Modbus or N2)

Equipment start-up and commissioning by a factory trained technician is recommended.
Contact your supplying distributor or sales representative for additional information & guidance.

WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

YORK®

Outdoor Split System

York Split-System R-410A Outdoor

Project Name: **University of Guam**

Unit Model #: **YD600C00A4GEB2**

Quantity: **1** Tag #: **ACCU-1**

System: **YD600C00A4GEB2**

Cooling Performance	
Total gross capacity	624.1 MBH
Sensible gross capacity	462.4 MBH
Total net capacity	596.6 MBH
Sensible net capacity	434.9 MBH
Efficiency (at ARI)	10.00 EER
Ambient DB temp.	95.0 °F
Unit Leaving DB temp.	59.9 °F
Unit Leaving WB temp.	57.6 °F
Leaving air temp dew point	56.30 °F
Power input (w/o blower)	51.17 kW
Sound power	93 dB(A)

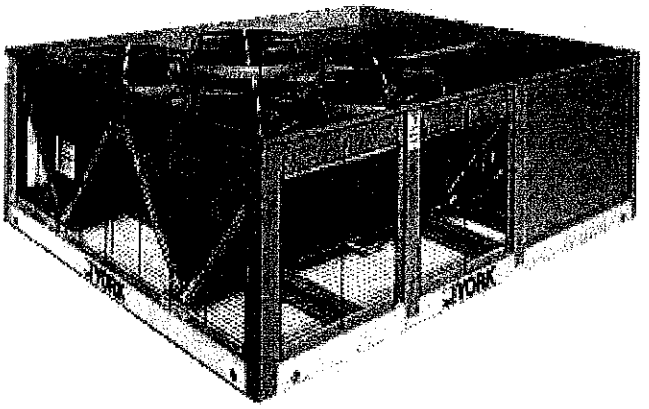
Refrigerant	
Refrigerant type	R-410A

Electrical Data	
Power supply	460-3-60
Unit min circuit ampacity	90.7 Amps
Unit max over-current protection	100 Amps

Dimensions & Weight					
Hgt	58 in.	Len	129 in.	Wth	89 in.
Weight with factory installed options					2345 lbs.

Clearances					
Right	30 in.	Front	36 in.	Rear	24 in.
Top	120 in.	Bottom	0 in.	Left	30 in.

Note: Please refer to the tech guide for listed maximum static pressures



50 Ton

- York units are Manufactured at an ISO 9001 Registered Facility and each Rooftop is Completely Computer-run Tested Prior to Shipment.

Unit Features

- Four Stage Cooling
- Unit Cabinet Constructed of Powder Painted Steel, Certified At 750 HoursSalt Spray Test (ASTM B-117 Standards)
- Full Perimeter Base rails with Built in Rigging Capabilities
- Dual Circuit 4 Stage Cooling with Scroll Compressor
- Solid Core Liquid Line Filter Driers
- Electrofin Copper Tube/Copper Fin Condenser Coil
- Sweat Connection Fittings
- Single Point Power Connection
- Phase Monitor
- Condenser Coil Guards Standard
- Short Circuit Current: 5kA RMS Symmetrical

Standard Unit Controller: Smart Equipment Control Board

- An Integrated Low-Ambient Control, Anti-short Cycle Protection, Lead-Lag, Fan on and Fan off Delays, Low Voltage Protection, On-board Diagnostic and Fault Code Display
- Safety Monitoring - Monitors the High and Low-Pressure Switches. The Unit Control Board will Alarm on Compressor Lockouts and Repeated Limit Switch Trips

BAS Controller

- Smart Equipment Controller with Gateway to BACnet MS/TP (Programmable to Modbus or N2)

Warranty

- One (1) Year Limited Warranty on the Complete Unit
- One (1) Year Warranty - Compressors
- Three (3) Year Warranty – ElectroFin Condenser Coil

Project Name: **University of Guam** Unit Model #: **YD600C00A4GEB2**

Quantity: 1 Tag #: **ACCU-1** System: **YD600C00A4GEB2**

Additional Electrical Data		
Power supply	460-3-60	
Unit min circuit ampacity	90.7	Amps
Unit max over-current protection	100	Amps
Min Voltage	432	V
Max Voltage	504	V
Comp #1 RLA	18.6	
Comp #1 LRA	125	
Comp #2 RLA	18.6	
Comp #2 LRA	125	
Comp #3 RLA	18.6	
Comp #3 LRA	125	
Comp #4 RLA	18.6	
Comp #4 LRA	125	
Outdoor Mtr Qty	4	
Outdoor Fan Voltage	460-3-60	
OD Fan Mtr FLA (ea.)	2.9	

Project Name: **University of Guam**

Unit Model #: **YD600C00A4GEB2**

Quantity: 1 Tag #: **ACCU-1**

System: **YD600C00A4GEB2**

Factory Installed Options

YD600C00A4GEB2

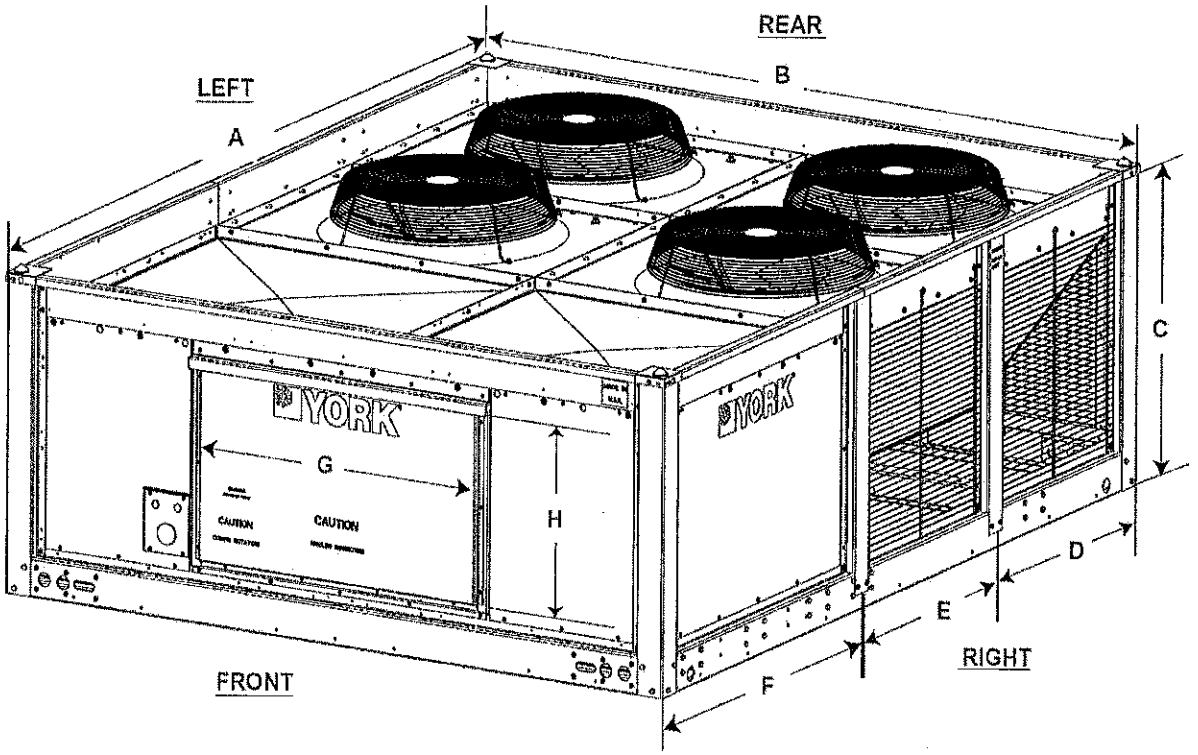
Equipment Options		Option(s) Selected
Product Category:	**Y**	York Split System R-410A Air Conditioner
Product Identifier:	**D**	4-Pipe
Nominal Cooling Capacity:	**600**	50 Ton
Airflow:	**A**	
Voltage:	**4**	460-3-60
Installation Options:	**G**	HACR Circuit Breaker/Disconnect
Additional Options:	**EB**	Electrofin Copper Tube/Copper Fin Condenser Coil Phase Monitor Smart Equipment Controller with Gateway to BACnet MS/TP (Programmable to Modbus or N2)
Product Generation:	**2**	

Project Name: **University of Guam**

Unit Model #: **YD600C00A4GEB2**

Quantity: **1** Tag #: **ACCU-1**

Unit Dimensions



YD Unit Dimensions

Unit Dimensions (Inches)

Model	A	B	C	D	E	F	G	H
YD360	128.5	88.5	37.5	41.8	40.0	46.1	37.1	23.6
YD480	128.5	88.5	57.7	41.8	40.0	46.1	37.1	23.6
YD600	128.5	88.5	57.7	41.8	40.0	46.1	37.1	23.6

Piping And Electrical Connections

Piping connections are made from the rear of the unit. Connections can be made directly to the suction and liquid line service valves.

Piping can be routed to the unit from the left or right side.

Electrical connections for power and control wiring is made from the front of all units, left of the electrical control box access. See piping sizes and electrical knockout details.

Unit Clearances

Location	Dimensions
Overhead (Top)[1]	120"
Front access panels	36"
Left Side	30"
Right Side	30"
Rear	24"
Bottom[2]	0"

1 Units must be installed outdoors. Overhanging structures or shrubs should not obstruct condenser air discharge.

2 Adequate snow clearance must be provided if winter operation is expected.

EXHIBIT 10-2

Johnson Controls

SUBMITTAL DATA

Order #: **Date:** 09/15/2021

Project: University of Guam

Project #:

Submitter: Norberto Tiru
GUAM MICROTECH CORPORATION
#4 C&S Building,
Dededo, Guam 96929
671-989-0100

Date
09/15/2021
Project Name
University of Guam
Project Number
Client / Purchaser

Johnson Controls

Submittal Summary Page

Qty	Tag #	Model # / Material #	Description
1	(ACU-1)	(YD480C00A2AAA2)	(40 Ton, York Split System R-410A Air Conditioner, 4-Pipe, Four) (Stage Cooling, 208/230-3-60, E-coated Copper Tube/Copper Fin) (Condenser Coil) **Smart Equipment Controller**

Equipment start-up and commissioning by a factory trained technician is recommended.
Contact your supplying distributor or sales representative for additional information & guidance.

WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

YORK®

Outdoor Split System

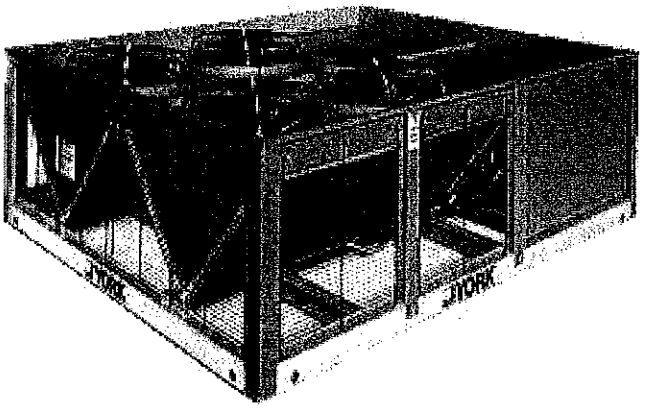
York Split-System R-410A Outdoor

Project Name: **University of Guam** | Unit Model #: **YD480C00A2AAA2**

Quantity: **1** Tag #: **ACU-1** | System: **YD480C00A2AAA2**

Cooling Performance					
Total gross capacity				468.8	MBH
Total net capacity				468.8	MBH
Ambient DB temp.				95.0	°F
Power input (w/o blower)				37.38	kW
Suction pressure				130	psig
Saturated suction temp.				45	°F
Refrigerant					
Refrigerant type				R-410A	
Electrical Data					
Power supply				208-3-60	
Unit min circuit ampacity				151.1	Amps
Unit max over-current protection				175	Amps
Dimensions & Weight					
Hgt	58 in.	Len	129 in.	Wth	89 in.
Weight with factory installed options				2315	lbs.
Clearances					
Right	30 in.	Front	36 in.	Rear	24 in.
Top	120 in.	Bottom	0 in.	Left	30 in.

Note: Please refer to the tech guide for listed maximum static pressures



40 Ton

- York units are Manufactured at an ISO 9001 Registered Facility and each Rooftop is Completely Computer-run Tested Prior to Shipment.

Unit Features

- Four Stage Cooling
- Unit Cabinet Constructed of Powder Painted Steel, Certified At 750 HoursSalt Spray Test (ASTM B-117 Standards)
- Full Perimeter Base rails with Built in Rigging Capabilities
- Dual Circuit 4 Stage Cooling with Scroll Compressor
- Solid Core Liquid Line Filter Driers
- E-coated Copper Tube/Copper Fin Condenser Coil
- Sweat Connection Fittings
- Single Point Power Connection
- Condenser Coil Guards Standard
- Short Circuit Current: 5kA RMS Symmetrical

Standard Unit Controller: Smart Equipment Control Board

- An Integrated Low-Ambient Control, Anti-short Cycle Protection, Lead-Lag, Fan on and Fan off Delays, Low Voltage Protection, On-board Diagnostic and Fault Code Display
- Safety Monitoring - Monitors the High and Low-Pressure Switches. The Unit Control Board will Alarm on Compressor Lockouts and Repeated Limit Switch Trips

BAS Controller

- Smart Equipment Controller

Warranty

- One (1) Year Limited Warranty on the Complete Unit
- One (1) Year Warranty - Compressors

Project Name: **University of Guam**

Unit Model #: **YD480C00A2AAA2**

Quantity: 1 Tag #: **ACU-1**

System: **YD480C00A2AAA2**

Factory Installed Options

YD480C00A2AAA2

Equipment Options		Option(s) Selected
Product Category:	**Y**	York Split System R-410A Air Conditioner
Product Identifier:	**D**	4-Pipe
Nominal Cooling Capacity:	**480**	40 Ton
Airflow:	**A**	
Voltage:	**2**	208/230-3-60
Installation Options:	**A**	
Additional Options:	**AA**	E-coated Copper Tube/Copper Fin Condenser Coil Smart Equipment Controller
Product Generation:	**2**	

Field Installed Accessories

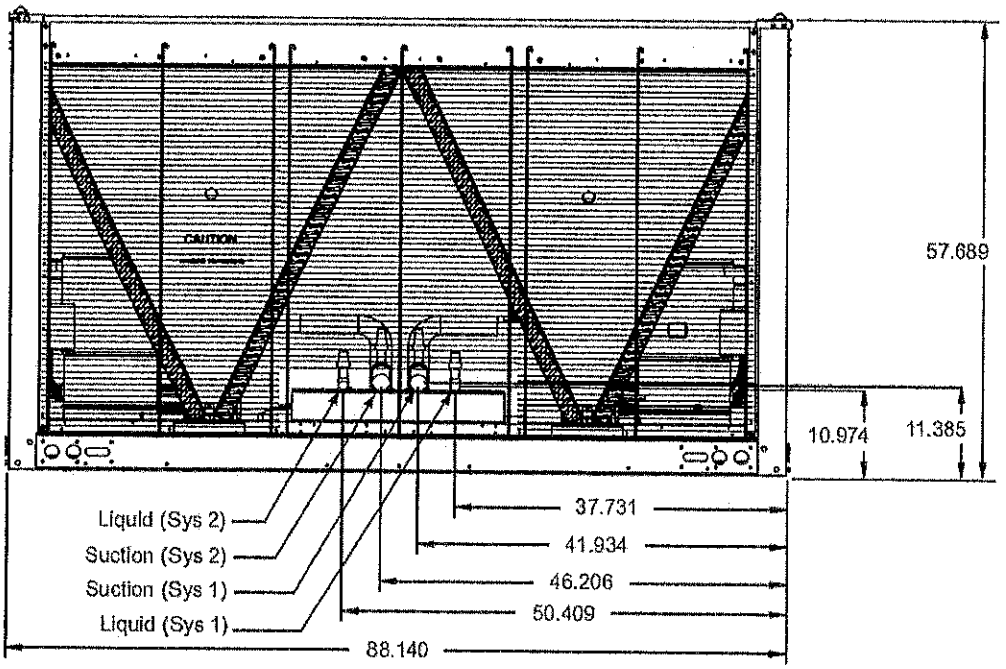
- O 1WS0408 - Metal Skid for Fork Truck Handling (225.0 lbs)
- O 1WS0410 - Wooden Skid for Fork Truck Handling (200.0 lbs)
- O 2ET077001124 - Honeywell T7350, 2 Heat / 4 Cool, Auto/Man Changeover, Electronic 7 Day Programmable (2.0 lbs)
- O 2HG04700824 - Hot Gas Bypass Kit (5.0 lbs)
- O 2LA04714025 - Low Ambient Kit 208/230V 40 & 50T (3.0 lbs)
- O 2PM04700124 - Phase Monitor Kit - Includes Control and associated wiring. This accessory provides protection against phase reversal, loss or unbalance. (13.0 lbs)
- O S1-MP-PRTKIT-0P - MAP (Multiple Access Portal) Gateway Kit- Replacement MAP gateway protective case, lanyard and communication cable. Use only to replace worn or damaged components. (0.3 lbs)
- O S1-SE-COM1001-0 - Field Installed Communication Card for Simplicity SE control. Can be field configurable for BACnet, N2 or ModBUS MSTP (0.0 lbs)
- O S1-YK-MAP1810-0P - MAP (Multiple Access Portal) Gateway-For use with SimplicitySE Control. (0.2 lbs)
- O S1-YK-MAP1810-0S - Stationary MAP Gateway (Includes MAP Gateway, Field Bus Adapter, Mounting Bracket and 100 to 240 VAC Power Supply). US-compatible counties. (1.9 lbs)

Project Name: **University of Guam** Unit Model #: **YD480C00A2AAA2**

Quantity: **1** Tag #: **ACU-1**

Piping and Connection

40 & 50 Ton Piping Connections



Piping And Electrical Connection Sizes (30/40/50T) (Inches)

Connection Entry	Size
Suction Line Sys #1	1-5/8 OD
Liquid Line Sys #1	7/8 OD
Suction Line Sys #2	1-5/8 OD
Liquid Line Sys #2	7/8 OD
Power Wiring Knockout	SEE BELOW
Control Wiring	7/8 HOLE

Electrical Power Knockout Sizes (Inches)

Connection Entry	30-40-50T/230V	30-40-50T/460-575V
Power Wiring	2-1/2"	1-1/2"

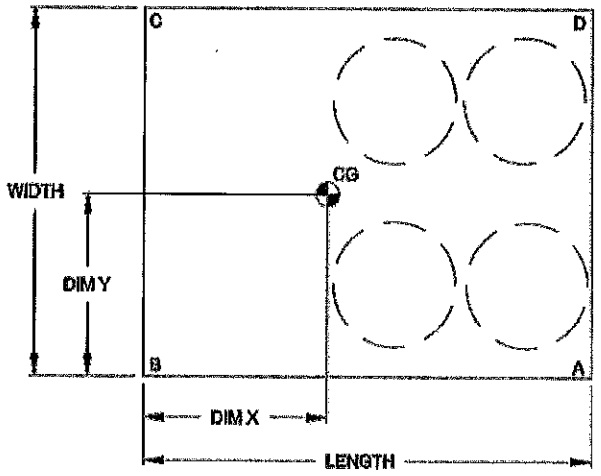
Project Name: **University of Guam** Unit Model #: **YD480C00A2AAA2**

Quantity: 1 Tag #: **ACU-1**

Corner Weights & Center of Gravity

Corner Weights & Center Of Gravity (Inches)

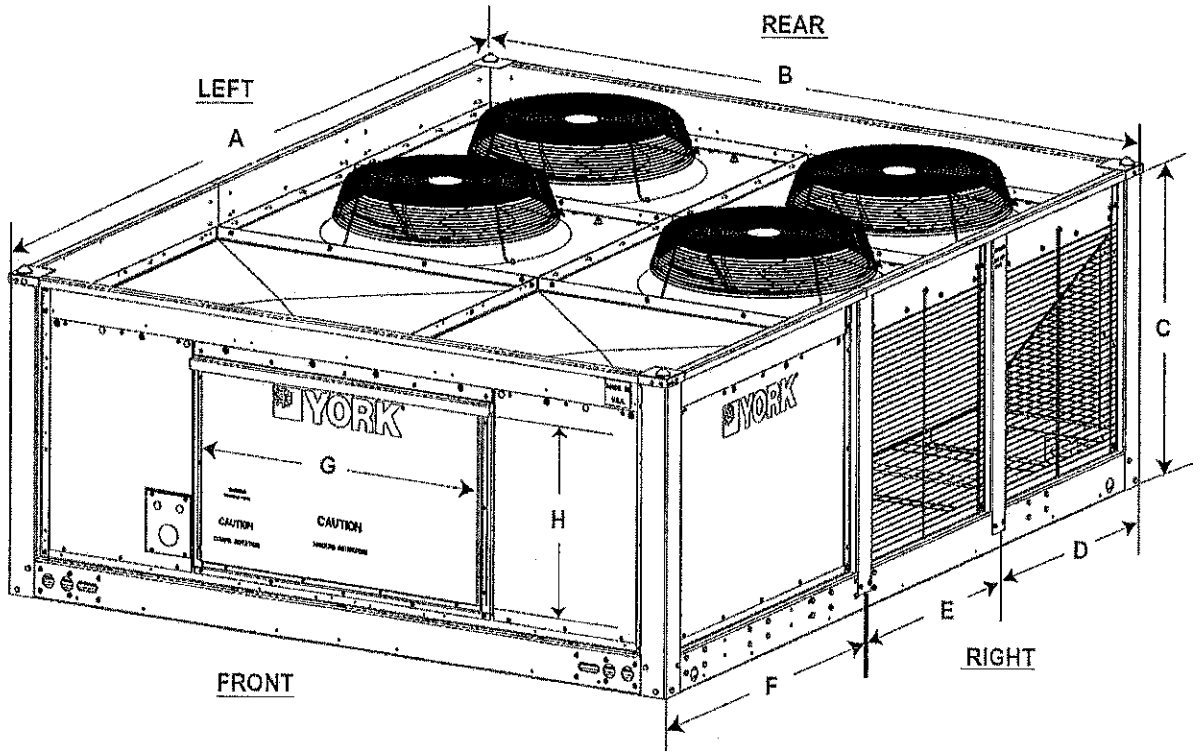
Unit Model	Unit Weight (Lbs.)		Unit Dimensions (inches)		A	B	C	D	Dim X	Dim Y	Weight A to B	Weight D to C
	Shipping	Operation	Length	Width								
YD360	1875	1895	128.5	88.5	404	537	533	401	55.2	44.1	934	941
YD480	2315	2347	128.5	88.5	486	675	671	483	53.8	44.1	1164	1161
YD600	2345	2381	128.5	88.5	486	693	686	481	53.0	44.0	1166	1179



Project Name: **University of Guam** Unit Model #: **YD480C00A2AAA2**

Quantity: **1** Tag #: **ACU-1**

Unit Dimensions



YD Unit Dimensions

Unit Dimensions (Inches)

Model	A	B	C	D	E	F	G	H
YD360	128.5	88.5	37.5	41.8	40.0	46.1	37.1	23.6
YD480	128.5	88.5	57.7	41.8	40.0	46.1	37.1	23.6
YD600	128.5	88.5	57.7	41.8	40.0	46.1	37.1	23.6

Piping And Electrical Connections

Piping connections are made from the rear of the unit. Connections can be made directly to the suction and liquid line service valves.

Piping can be routed to the unit from the left or right side.

Electrical connections for power and control wiring is made from the front of all units, left of the electrical control box access. See piping sizes and electrical knockout details.

Unit Clearances

Location	Dimensions
Overhead (Top)[1]	120"
Front access panels	36"
Left Side	30"
Right Side	30"
Rear	24"
Bottom[2]	0"

1 Units must be installed outdoors. Overhanging structures or shrubs should not obstruct condenser air discharge.

2 Adequate snow clearance must be provided if winter operation is expected.

Project Name: **University of Guam** Unit Model #: **YD480C00A2AAA2**

Quantity: 1 Tag #: **ACU-1**

Sound Performance

Sound Performance

Outdoor Sound Power Levels (dB), 60 Hz

Model	Nominal Tonnage	dB(A)[1]	Octave Bands (Hz)							
			63	125	250	500	1000	2000	4000	8000
YD360	30	92	90	93	91	89	87	83	79	74
YD480	40	92	90	93	91	89	87	84	80	75
YD600	50	93	91	94	92	90	87	84	80	75

[1] Rated in accordance with ARI 270 Standard.

Project Name: **University of Guam** Unit Model #: **YD480C00A2AAA2**

Quantity: **1** Tag #: **ACU-1**

Wiring Diagram

40 & 50 Ton Power and Control Wiring Connections

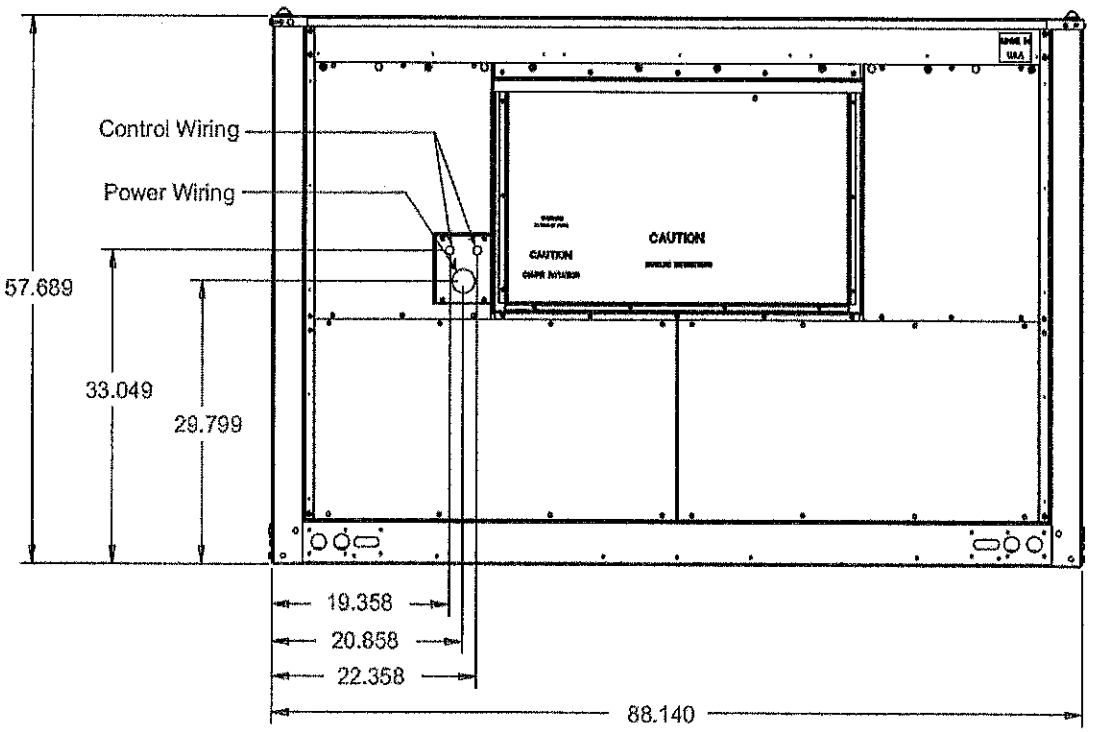


EXHIBIT 10-3

Johnson Controls

SUBMITTAL DATA

Order #: **Date:** 03/15/2022

Project: University of Guam

Project #:

Submitter: Norberto Tiru
GUAM MICROTECH CORPORATION
#4 C&S Building,
Dededo, Guam 96929
671-989-0100

Date
03/15/2022
Project Name
University of Guam
Project Number
Client / Purchaser

Johnson Controls

Submittal Summary Page

Qty	Tag #	Model # / Material #	Description
1	ACCU-3	YD360C00A4GEB2	30 Ton, York Split System R-410A Air Conditioner, 4-Pipe, Four Stage Cooling, 460-3-60 • HACR Circuit Breaker/Disconnect • Electrofin Copper Tube/Copper Fin Condenser Coil • Smart Equipment Controller with Gateway to BACnet MS/TP (Programmable to Modbus or N2)

Equipment start-up and commissioning by a factory trained technician is recommended.
Contact your supplying distributor or sales representative for additional information & guidance.

WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

YORK®

Outdoor Split System

York Split-System R-410A Outdoor

Project Name: **University of Guam**

Unit Model #: **YD360C00A4GEB2**

Quantity: **1** Tag #: **ACCU-3**

System: **YD360C00A4GEB2**

Cooling Performance		
Total gross capacity	375.0	MBH
Sensible gross capacity	266.3	MBH
Total net capacity	357.6	MBH
Sensible net capacity	248.9	MBH
Efficiency (at ARI)	10.00	EER
Ambient DB temp.	95.0	°F
Unit Leaving DB temp.	60.8	°F
Unit Leaving WB temp.	57.6	°F
Leaving air temp dew point	55.60	°F
Power input (w/o blower)	30.39	kW
Sound power	92	dB(A)

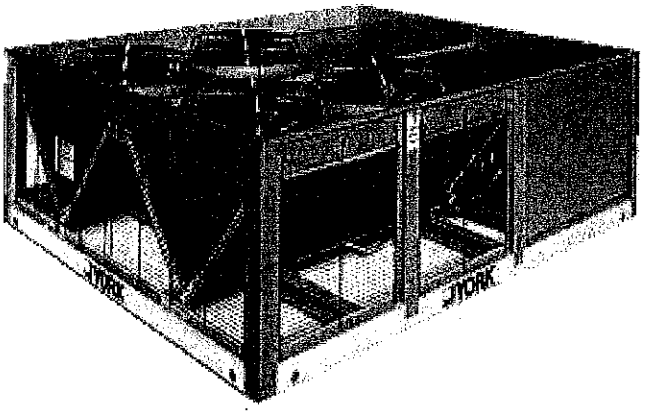
Refrigerant	
Refrigerant type	R-410A

Electrical Data		
Power supply	460-3-60	
Unit min circuit ampacity	63.5	Amps
Unit max over-current protection	70	Amps

Dimensions & Weight					
Hgt	38 in.	Len	129 in.	Wth	89 in.
Weight with factory installed options					1875 lbs.

Clearances					
Right	30 in.	Front	36 in.	Rear	24 in.
Top	120 in.	Bottom	0 in.	Left	30 in.

Note: Please refer to the tech guide for listed maximum static pressures



30 Ton

- York units are Manufactured at an ISO 9001 Registered Facility and each Rooftop is Completely Computer-run Tested Prior to Shipment.

Unit Features

- Four Stage Cooling
- Unit Cabinet Constructed of Powder Painted Steel, Certified At 750 HoursSalt Spray Test (ASTM B-117 Standards)
- Full Perimeter Base rails with Built in Rigging Capabilities
- Dual Circuit 4 Stage Cooling with Scroll Compressor
- Solid Core Liquid Line Filter Driers
- Electrofin Copper Tube/Copper Fin Condenser Coil
- Sweat Connection Fittings
- Single Point Power Connection
- Phase Monitor
- Condenser Coil Guards Standard
- Short Circuit Current: 5kA RMS Symmetrical

Standard Unit Controller: Smart Equipment Control Board

- An Integrated Low-Ambient Control, Anti-short Cycle Protection, Lead-Lag, Fan on and Fan off Delays, Low Voltage Protection, On-board Diagnostic and Fault Code Display
- Safety Monitoring - Monitors the High and Low-Pressure Switches. The Unit Control Board will Alarm on Compressor Lockouts and Repeated Limit Switch Trips

BAS Controller

- Smart Equipment Controller with Gateway to BACnet MS/TP (Programmable to Modbus or N2)

Warranty

- One (1) Year Limited Warranty on the Complete Unit
- One (1) Year Warranty - Compressors
- Three (3) Year Warranty – ElectroFin Condenser Coil

Project Name: **University of Guam**

Unit Model #: **YD360C00A4GEB2**

Quantity: **1** Tag #: **ACCU-3**

System: **YD360C00A4GEB2**

Additional Electrical Data		
Power supply	460-3-60	
Unit min circuit ampacity	63.5	Amps
Unit max over-current protection	70	Amps
Min Voltage	432	V
Max Voltage	504	V
Comp #1 RLA	12.2	
Comp #1 LRA	100	
Comp #2 RLA	12.2	
Comp #2 LRA	100	
Comp #3 RLA	12.2	
Comp #3 LRA	100	
Comp #4 RLA	12.2	
Comp #4 LRA	100	
Outdoor Mtr Qty	4	
Outdoor Fan Voltage	460-3-60	
OD Fan Mtr FLA (ea.)	2.9	

Project Name: **University of Guam**

Unit Model #: **YD360C00A4GEB2**

Quantity: 1 Tag #: **ACCU-3**

System: **YD360C00A4GEB2**

Factory Installed Options

YD360C00A4GEB2

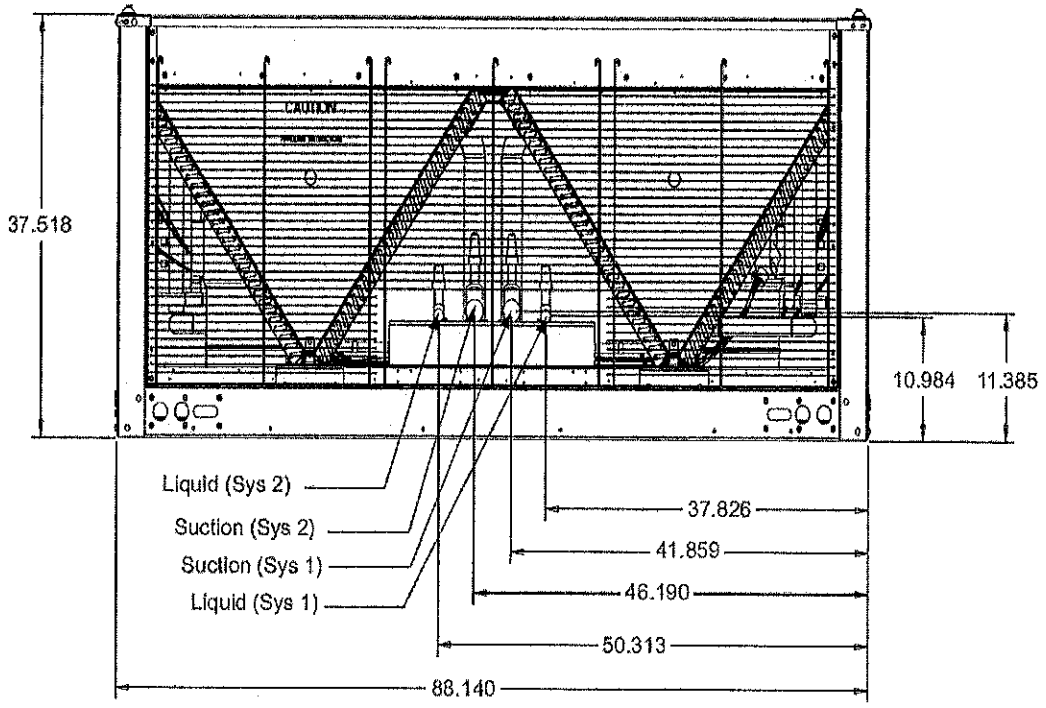
Equipment Options		Option(s) Selected
Product Category:	**Y**	York Split System R-410A Air Conditioner
Product Identifier:	**D**	4-Pipe
Nominal Cooling Capacity:	**360**	30 Ton
Airflow:	**A**	
Voltage:	**4**	460-3-60
Installation Options:	**G**	HACR Circuit Breaker/Disconnect
Additional Options:	**EB**	Electrofin Copper Tube/Copper Fin Condenser Coil Smart Equipment Controller with Gateway to BACnet MS/TP (Programmable to Modbus or N2)
Product Generation:	**2**	

Project Name: **University of Guam** Unit Model #: **YD360C00A4GEB2**

Quantity: 1 Tag #: **ACCU-3**

Piping and Connection

30 Ton Piping Connections



Piping And Electrical Connection Sizes (30/40/50T) (Inches)

Connection Entry	Size
Suction Line Sys #1	1-5/8 OD
Liquid Line Sys #1	7/8 OD
Suction Line Sys #2	1-5/8 OD
Liquid Line Sys #2	7/8 OD
Power Wiring Knockout	SEE BELOW
Control Wiring	7/8 HOLE

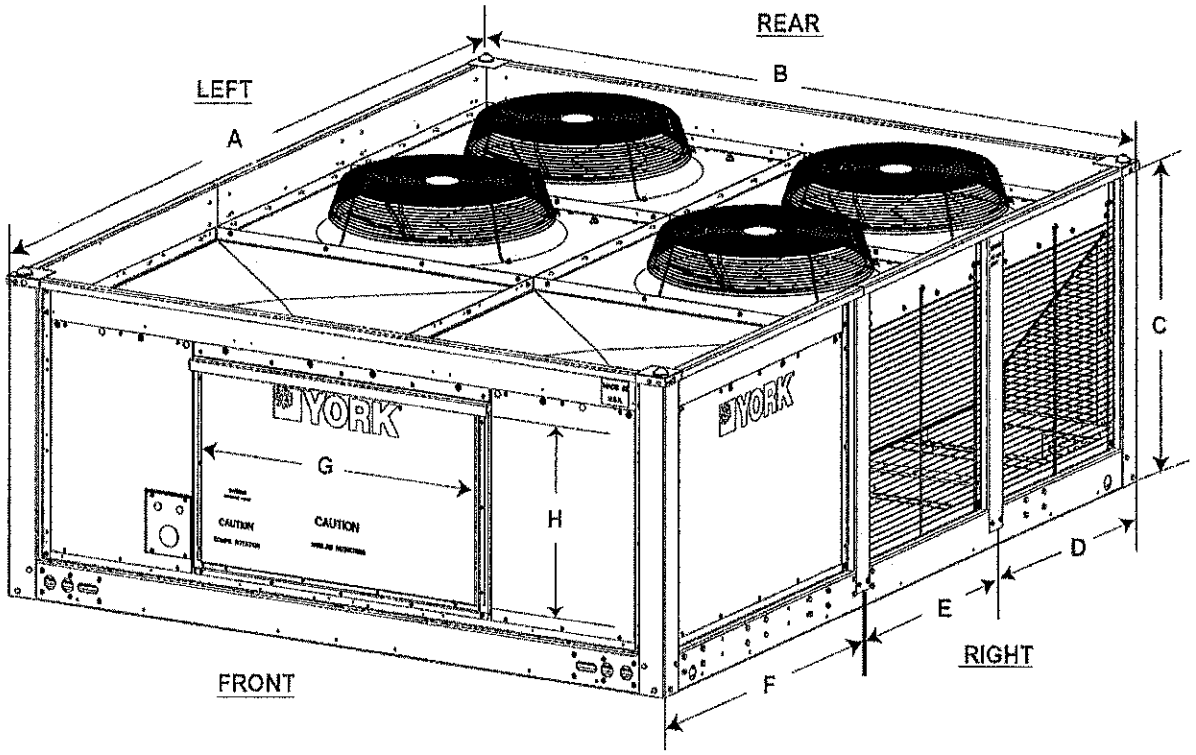
Electrical Power Knockout Sizes (Inches)

Connection Entry	30-40-50T/230V	30-40-50T/460-575V
Power Wiring	2-1/2"	1-1/2"

Project Name: **University of Guam** Unit Model #: **YD360C00A4GEB2**

Quantity: **1** Tag #: **ACCU-3**

Unit Dimensions



YD Unit Dimensions

Unit Dimensions (Inches)

Model	A	B	C	D	E	F	G	H
YD360	128.5	88.5	37.5	41.8	40.0	46.1	37.1	23.6
YD480	128.5	88.5	57.7	41.8	40.0	46.1	37.1	23.6
YD600	128.5	88.5	57.7	41.8	40.0	46.1	37.1	23.6

Piping And Electrical Connections

Piping connections are made from the rear of the unit. Connections can be made directly to the suction and liquid line service valves.

Piping can be routed to the unit from the left or right side.

Electrical connections for power and control wiring is made from the front of all units, left of the electrical control box access. See piping sizes and electrical knockout details.

Unit Clearances

Location	Dimensions
Overhead (Top)[1]	120"
Front access panels	36"
Left Side	30"
Right Side	30"
Rear	24"
Bottom[2]	0"

1 Units must be installed outdoors. Overhanging structures or shrubs should not obstruct condenser air discharge.

2 Adequate snow clearance must be provided if winter operation is expected.

EXHIBIT 10-4

Johnson Controls

SUBMITTAL DATA

Order #: **Date:** 09/25/2019

Project: UOG

Project #:

Submitter: Norberto Tiru
GUAM MICROTECH CORPORATION
#4 C&S Building,
Dededo, Guam 96929
671-989-0100

Date
09/25/2019
Project Name
UOG
Project Number
Client / Purchaser

Johnson Controls

Submittal Summary Page

Qty	Tag #	Model #	Description
1	ACCU-2	YC240C00A4ATA4	20 Ton, York Predator Split System R-410A Air Conditioner, 2-Pipe **R-410A, Two Stage Cooling, Standard Motor, 460-3-60, Smart Equipment Controller** • Technicoat Copper Tube/Copper Fin Condenser Coil
1			
1			

Equipment start-up and commissioning by a factory trained technician is recommended.
Contact your supplying distributor or sales representative for additional information & guidance.

⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

YORK®

Predator OD Split System

York Split-System R-410A Outdoor

Project Name: **UOG**

Unit Model #: **YC240C00A4ATA4**

Quantity: **1** Tag #: **ACCU-2**

System: **YC240C00A4ATA4,NL240C00E4DAA2**

Cooling Performance	
Total gross capacity	242.0 MBH
Sensible gross capacity	174.0 MBH
Total net capacity	231.5 MBH
Sensible net capacity	163.5 MBH
Efficiency (at ARI)	11.00 EER
Integrated eff. (at ARI)	13.00 IEER
Ambient DB temp.	95.0 °F
Power input (w/o blower)	17.90 kW
Sound power	93 dB(A)

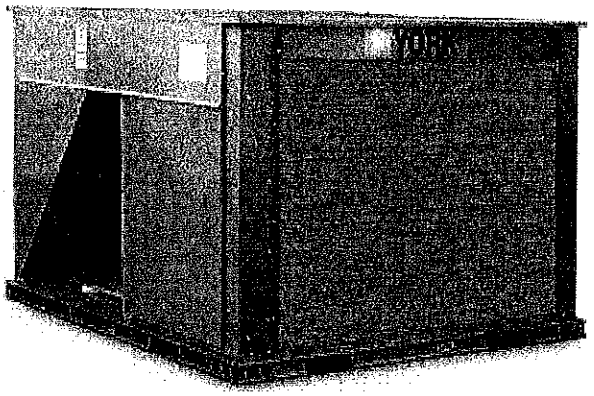
Refrigerant	
Refrigerant type	R-410A

Electrical Data	
Power supply	460-3-60
Unit min circuit ampacity	44 Amps
Unit max over-current protection	60 Amps

Dimensions & Weight					
Hgt	50 in.	Len	59 in.	Wth	64 in.
Weight with factory installed options					945 lbs.

Clearances					
Right	30 in.	Front	36 in.	Rear	24 in.
Top	120 in.	Bottom	0 in.	Left	30 in.

Note: Please refer to the tech guide for listed maximum static pressures



20 Ton

- YORK Predator Split System Units are Manufactured at an ISO 9001 Registered Facility.

Unit Features

- Two Stage Cooling
- Unit Cabinet Constructed of Powder Painted Steel, Certified At 750 Hours Salt Spray Test (ASTM B-117 Standards)
- Full Perimeter Base Rails with Built in Rigging Capabilities
- Scroll Compressors with Crankcase Heater
- Single Refrigeration Circuit (2 Pipe)
- Liquid Line Driers (Supplied for Field Installation)
- Technicoat Copper Tube/Copper Fins Condenser Coil
- Back Seating Suction and Liquid Line Service Valves
- Inherently Protected Fan Motors
- Low Ambient to 40°F
- Side or Bottom Single Point Power Connections
- Short Circuit Current: 5kA RMS Symmetrical

Standard Unit Controller: Smart Equipment Control Board

- Anti-Short Cycle Protection, Lead-Lag, Low Voltage Protection, On-Board Diagnostic and Fault Code Display
- Safety Monitoring - Monitors the High and Low-Pressure Switches. The Unit Control Board will Alarm on Compressor Lockouts and Repeated Limit Switch Trips.

BAS Controller

- Smart Equipment Controller

Warranty

- One (1) Year Limited Warranty on All Other Parts

Project Name: **UOG**

Unit Model #: **YC240C00A4ATA4**

Quantity: **1** Tag #: **ACCU-2**

System: **YC240C00A4ATA4,NL240C00E4DAA2**

Factory Installed Options

YC240C00A4ATA4

Equipment Options		Option(s) Selected
Product Category:	**Y**	York Predator Split System R-410A Air Conditioner
Product Identifier:	**C**	2-Pipe R-410A
Nominal Cooling Capacity:	**240**	20 Ton
Heat Type and Nominal Heat Capacity:	**C00**	
Airflow:	**A**	Standard Motor
Voltage:	**4**	460-3-60
Installation Options:	**A**	
Additional Options:	**TA**	Technicoat Copper Tube/Copper Fins Condenser Coil Smart Equipment Controller
Product Generation:	**4**	

Field Installed Accessories

- ○ 1CG0404 - Coil Guard (13.0 lbs)
- ○ 1HG0429 - Hail Guard (37.0 lbs)
- ○ 2HG04700624 - Hot Gas Bypass Kit; Includes discharge bypass valve and Copper pipe fittings for field installation. Used to modulate capacity at low load conditions. (5.0 lbs)
- ○ 2LA04702024 - Low Ambient To 0° F (3.2 lbs)
- ○ 2PM04700124 - Phase Monitor Kit - Includes Control and associated wiring. This accessory provides protection against phase reversal, loss or unbalance. (13.0 lbs)
- ○ S1-MP-PRTKIT-0P - MAP (Multiple Access Portal) Gateway Kit- Replacement MAP gateway protective case, lanyard and communication cable. Use only to replace worn or damaged components. (0.3 lbs)
- ○ S1-NSB8BHN041-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, No Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- ○ S1-NSB8BHN043-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, No Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- ○ S1-NSB8BHN141-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Warmer/Cooler Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- ○ S1-NSB8BHN143-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Warmer/Cooler Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- ○ S1-NSB8BHN240-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Full Display, WHITE, JCI LOGO, NS8000 Series (0.4 lbs)
- ○ S1-NSB8BHN241-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Full Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- ○ S1-NSB8BHN243-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Full Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- ○ S1-NSB8BPN240-0 - Wall Temperature and 2% Relative Humidity Combined Sensor, Full Display, WHITE, JCI LOGO, NS8000 Series (0.4 lbs)
- ○ S1-NSB8BPN241-0 - Wall Temperature and 2% Relative Humidity Combined Sensor, Full Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- ○ S1-NSB8BPN243-0 - Wall Temperature and 2% Relative Humidity Combined Sensor, Full Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- ○ S1-NSB8BTN041-0 - Wall Temperature Sensor, No Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- ○ S1-NSB8BTN043-0 - Wall Temperature Sensor, No Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- ○ S1-NSB8BTN141-0 - Wall Temperature Sensor, Warmer/Cooler Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- ○ S1-NSB8BTN143-0 - Wall Temperature Sensor, Warmer/Cooler Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- ○ S1-NSB8BTN240-0 - Wall Temperature Sensor, Full Display, WHITE, JCI LOGO, NS8000 Series (0.4 lbs)

Predator OD Split System

York Split-System R-410A Outdoor

Project Name: UOG

Quantity: 1 Tag #: ACCU-2

Unit Model #: YC240C00A4ATA4

System: YC240C00A4ATA4,NL240C00E4DAA2

Consolidated Drawing

NOTES:
1. FOR OUTDOOR USE ONLY.
2. WEIGHTS SHOWN ARE FOR OPERATING, WITHOUT HAIL GUARDS.
3. MIN. CLEARANCES TO BE
   RIGHT SIDE: 30 [762]
   LEFT SIDE: 30 [762]
   FRONT: 36 [914]
   REAR: 24 [610]
   TOP: 120 [3048]
   BOTTOM: 0 [0]
4. FOR SMALLER SERVICE AND OPERATIONAL CLEARANCES CONTACT JOHNSON CONTROLS APPLICATION ENGINEERING DEPARTMENT.
5. DIMENSIONS IN ( ) ARE IN MILLIMETERS OR KILOGRAMS

⚠6 PD/PJ & TD/YJ UNITS ONLY

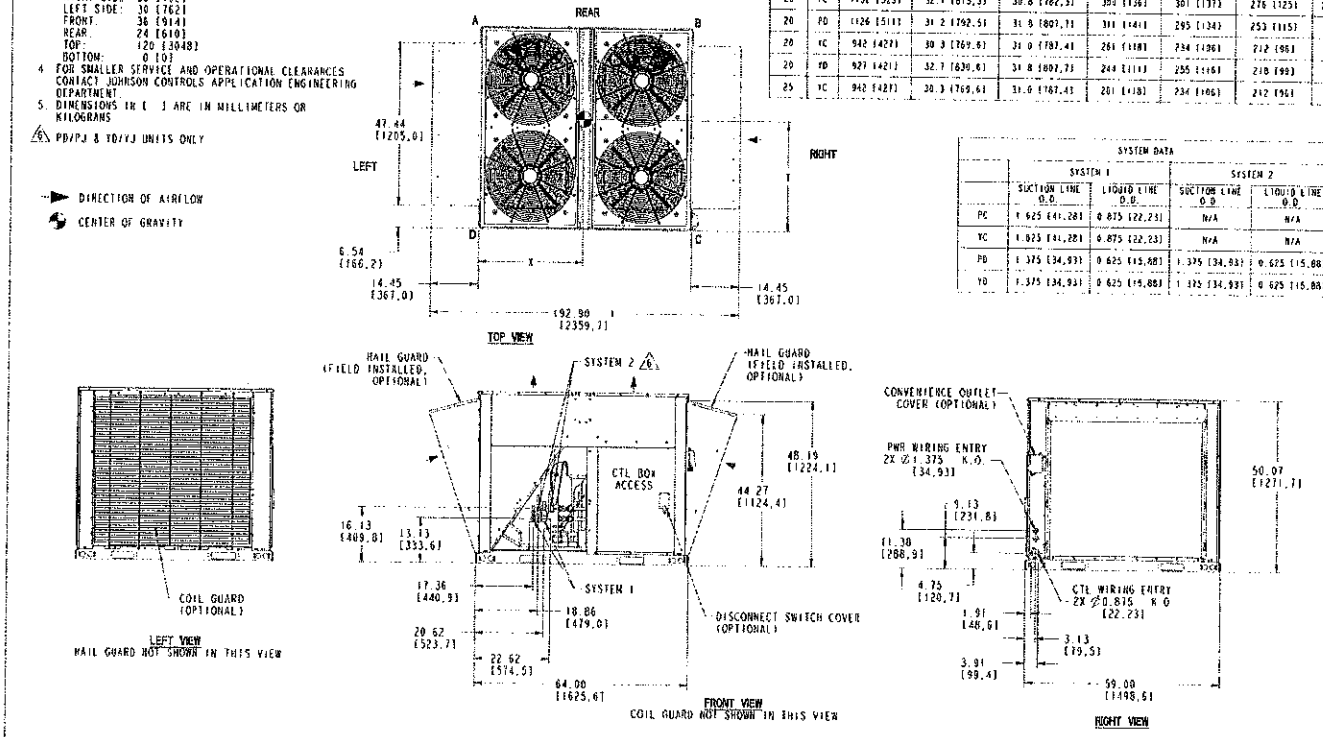
→ DIRECTION OF AIRFLOW

CENTER OF GRAVITY

TONNAGE	UNIT	OPERATING WEIGHT (LBS) (BASE UNIT)	CENTER OF GRAVITY LOCATION (BASE UNIT)		4 POINT CORNER LOADS (LBS) (BASE UNIT)			
			X	Y	A	B	C	D
20	PC	1152 [523]	32.1 [815.3]	30.8 [782.3]	303 [136]	301 [137]	276 [125]	275 [124.7]
20	PD	1126 [511]	31.2 [792.5]	31.8 [807.7]	301 [144]	295 [134]	253 [115]	287 [127]
20	YC	942 [427]	30.3 [769.6]	31.0 [787.4]	261 [118]	234 [106]	212 [96]	236 [107]
20	YD	927 [421]	32.7 [830.6]	31.8 [807.7]	244 [111]	255 [116]	218 [99]	210 [95]
25	YC	942 [427]	30.3 [769.6]	31.0 [787.4]	261 [118]	234 [106]	212 [96]	236 [107]

SYSTEM DATA

	SYSTEM 1		SYSTEM 2	
	SUCTION LINE O.D.	LIQUID LINE O.D.	SUCTION LINE O.D.	LIQUID LINE O.D.
PC	1.625 [41.28]	0.875 [22.23]	N/A	N/A
YC	1.625 [41.28]	0.875 [22.23]	N/A	N/A
PD	1.375 [34.93]	0.625 [15.88]	1.375 [34.93]	0.625 [15.88]
YD	1.375 [34.93]	0.625 [15.88]	1.375 [34.93]	0.625 [15.88]



SUBMITTAL DWG, OUTDOOR SPLIT, 20 & 25 TON, 2 & 4 PIPE, 50" CABINET

DRG NO. UST-PRED0D-40DF50H

PART NO.

REV D

EXHIBIT 10-5

Johnson Controls

SUBMITTAL DATA

Order #: **Date:** 03/15/2022

Project: University of Guam

Project #:

Submitter: Norberto Tiru
GUAM MICROTECH CORPORATION
#4 C&S Building,
Dededo, Guam 96929
671-989-0100

Date
03/15/2022
Project Name
University of Guam
Project Number
Client / Purchaser

Johnson Controls

Submittal Summary Page

Qty	Tag #	Model # / Material #	Description
1	ACCU-5	PC180C00A4QEE4	15 Ton, York Split System R-410A Heat Pump, 2-Pipe R-410A, Standard Motor, 460-3-60 • Powered Convenience Outlet (110 VAC / 15 Amp) • HACR Circuit Breaker/Disconnect • Phase Monitor • Coil Guard • Electrofin Condenser Coil • Electrofin Copper Tube/Copper Fin Condenser Coil • Smart Equipment Controller with Gateway to BACnet MS/TP (Programmable to Modbus or N2)

Equipment start-up and commissioning by a factory trained technician is recommended.
Contact your supplying distributor or sales representative for additional information & guidance.

WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

YORK®

Outdoor Split System

York Split-System R-410A Outdoor

Project Name: **University of Guam**

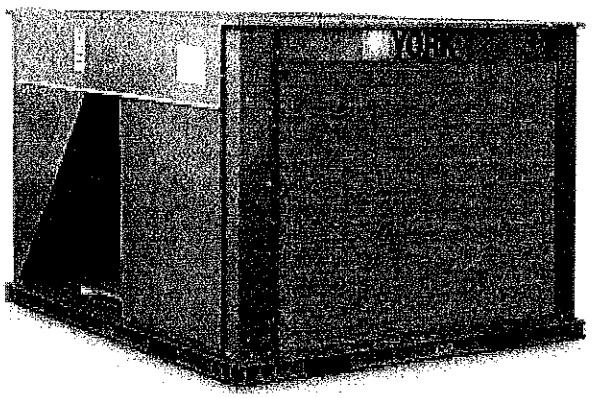
Unit Model #: **PC180C00A4QEE4**

Quantity: 1 Tag #: **ACCU-5**

System: **PC180C00A4QEE4,NL180C00D4CEJ2**

No Performance Data Available

Run Performance to view metrics



15 Ton

- YORK Split System Units are Manufactured at an ISO 9001 Registered Facility.

Unit Features

- Unit Cabinet Constructed of Powder Painted Steel, Certified At 750 Hours Salt Spray Test (ASTM B-117 Standards)
- Full Perimeter Base Rails with Built in Rigging Capabilities
- Scroll Compressors with Crankcase Heater
- Single Refrigeration Circuit (2 Pipe)
- Liquid Line Driers (Supplied for Field Installation)
- Suction Line Accumulator
- Electrofin Copper Tube/Copper Fin Condenser Coil
- Back Seating Suction and Liquid Line Service Valves
- Inherently Protected Fan Motors
- Side or Bottom Single Point Power Connections
- Disconnect Switch
- Powered Convenience Outlet (110 VAC / 15 Amp)
- Phase Monitor
- Coil Guard
- Short Circuit Current: 5kA RMS Symmetrical

Standard Unit Controller: Smart Equipment Control Board

- Anti-Short Cycle Protection, Lead-Lag, Low Voltage Protection, On-Board Diagnostic and Fault Code Display
- Safety Monitoring - Monitors the High and Low-Pressure Switches. The Unit Control Board will Alarm on Compressor Lockouts and Repeated Limit Switch Trips.

BAS Controller

- Smart Equipment Controller with Gateway to BACnet MS/TP (Programmable to Modbus or N2)

Warranty

- One (1) Year Limited Warranty on All Other Parts
- Three (3) Year Warranty – ElectroFin Condenser Coil

Project Name: **University of Guam**

Unit Model #: **PC180C00A4QEE4**

Quantity: **1** Tag #: **ACCU-5**

System: **PC180C00A4QEE4,NL180C00D4CEJ2**

Factory Installed Options

PC180C00A4QEE4

Equipment Options		Option(s) Selected
Product Category:	**P**	York Split System R-410A Heat Pump
Product Identifier:	**C**	2-Pipe R-410A
Nominal Cooling Capacity:	**180**	15 Ton
Heat Type and Nominal Heat Capacity:	**C00**	
Airflow:	**A**	Standard Motor
Voltage:	**4**	460-3-60
Installation Options:	**Q**	Powered Convenience Outlet (110 VAC / 15 Amp) HACR Circuit Breaker/Disconnect
Additional Options:	**EE**	Phase Monitor Coil Guard Electrofin Condenser Coil Electrofin Copper Tube/Copper Fin Condenser Coil Smart Equipment Controller with Gateway to BACnet MS/TP (Programmable to Modbus or N2)
Product Generation:	**4**	

Outdoor Split System

York Split-System R-410A Outdoor

Project Name: **University of Guam** Unit Model #: **PC180C00A4QEE4**

Quantity: 1 Tag #: **ACCU-5**

Consolidated Drawing

NOTES:
1. FOR OUTDOOR USE ONLY.
2. WEIGHTS SHOWN ARE FOR OPERATING, WITHOUT HAIL GUARDS.
3. MIN. CLEARANCES TO BE:
   RIGHT SIDE: 30 [762]
   LEFT SIDE: 30 [762]
   FRONT: 36 [914]
   REAR: 24 [610]
   TOP: 120 [3048]
   BOTTOM: 0 [0]
4. FOR SMALLER SERVICE AND OPERATIONAL CLEARANCES CONTACT JOHNSON CONTROLS APPLICATION ENGINEERING DEPARTMENT.
5. DIMENSIONS IN [ ] ARE IN MILLIMETERS OR KILOGRAMS
6. PD/PJ & YD/YJ UNITS ONLY.

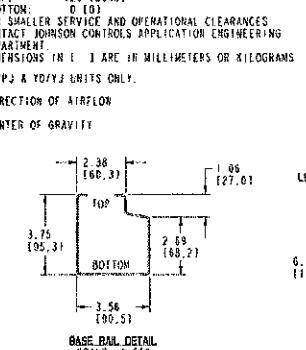
DIRECTION OF AIRFLOW

CENTER OF GRAVITY

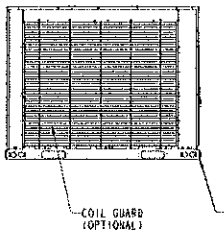
TONNAGE	UNIT	OPERATING WEIGHT LBS [KGS] (BASE UNIT)	CENTER OF GRAVITY LOCATION (BASE UNIT)		4 POINT CORNER LOADS LBS [KGS] (BASE UNIT)			
			X	Y	A	B	C	D
15	PC/PH	968 [439]	32.5 [825.5]	33 [838.2]	266 [121]	274 [124]	217 [98]	211 [96]
15	PD/PJ	942 [427]	34 [863.6]	32.5 [825.5]	243 [110]	275 [125]	225 [102]	199 [90]
15	YC/YH	955 [442]	32.5 [825.5]	31.5 [800.1]	239 [108]	246 [112]	245 [98]	209 [95]
15	YD/YJ	894 [406]	32.5 [825.5]	31.5 [800.1]	235 [107]	242 [110]	242 [98]	206 [93]

SYSTEM DATA

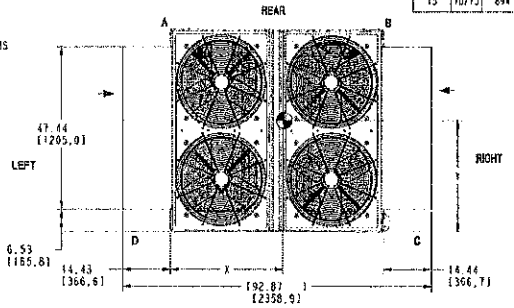
	SYSTEM 1		SYSTEM 2	
	SUCTION LINE O.D.	LIQUID LINE O.D.	SUCTION LINE O.D.	LIQUID LINE O.D.
PC/PH	1.625 [41.28]	0.875 [22.23]	N/A	N/A
YC/YH	1.625 [41.28]	0.875 [22.23]	N/A	N/A
PD/PJ	1.375 [34.93]	0.625 [15.88]	1.375 [34.93]	0.625 [15.88]
YD/YJ	1.375 [34.93]	0.625 [15.88]	1.375 [34.93]	0.625 [15.88]



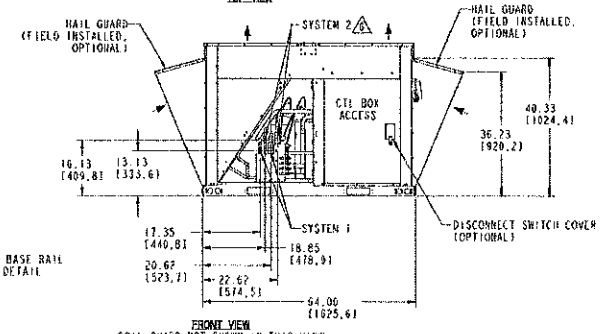
BASE RAIL DETAIL
SCALE 0.506



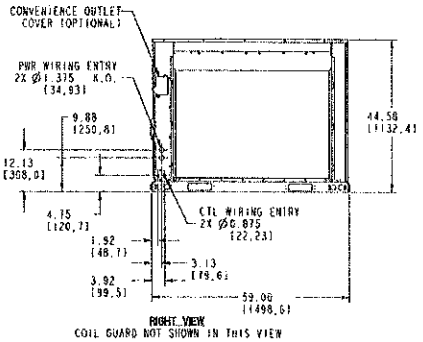
LEFT VIEW
HAIL GUARD NOT SHOWN IN THIS VIEW



TOP VIEW



FRONT VIEW
COIL GUARD NOT SHOWN IN THIS VIEW



RIGHT VIEW
COIL GUARD NOT SHOWN IN THIS VIEW

REV LEV	DATE	REVISION RECORD	EC NO	DR	CK	ENG
A	02-11-20	NEW DRAWING (FROM UST-PRC010-400F45H)	75768	LOP	MCH	SAS

THIRD ANGLE PROJECTION

DRAWING PER ASME Y14.5-2009
DIMENSIONS UNLESS OTHERWISE SPECIFIED

		DATE
DRN	C. MICHAUD	02-11-20
CHK	P. MICHAUD	02-11-20
ENG	S. ADENT	02-11-20
MFG		

ONE PLACE DECIMAL ± .1
TWO PLACE DECIMAL ± .03
THREE PLACE DECIMAL ± .010
ANGLES ± 2°
DIMENSIONS ARE IN INCHES
DO NOT SCALE PRINT
SCALED .060

SUBMITTAL DWG, OUTDOOR SPLIT, 15 TON, 2 & 4 PIPE, 44.5" CABINET

JOHNSON CONTROLS
UNITARY PRODUCTS GROUP
NORMAL, OK 73069

SAFETY AND KEY CHARACTERISTICS PER SE-ROP-ESD-01

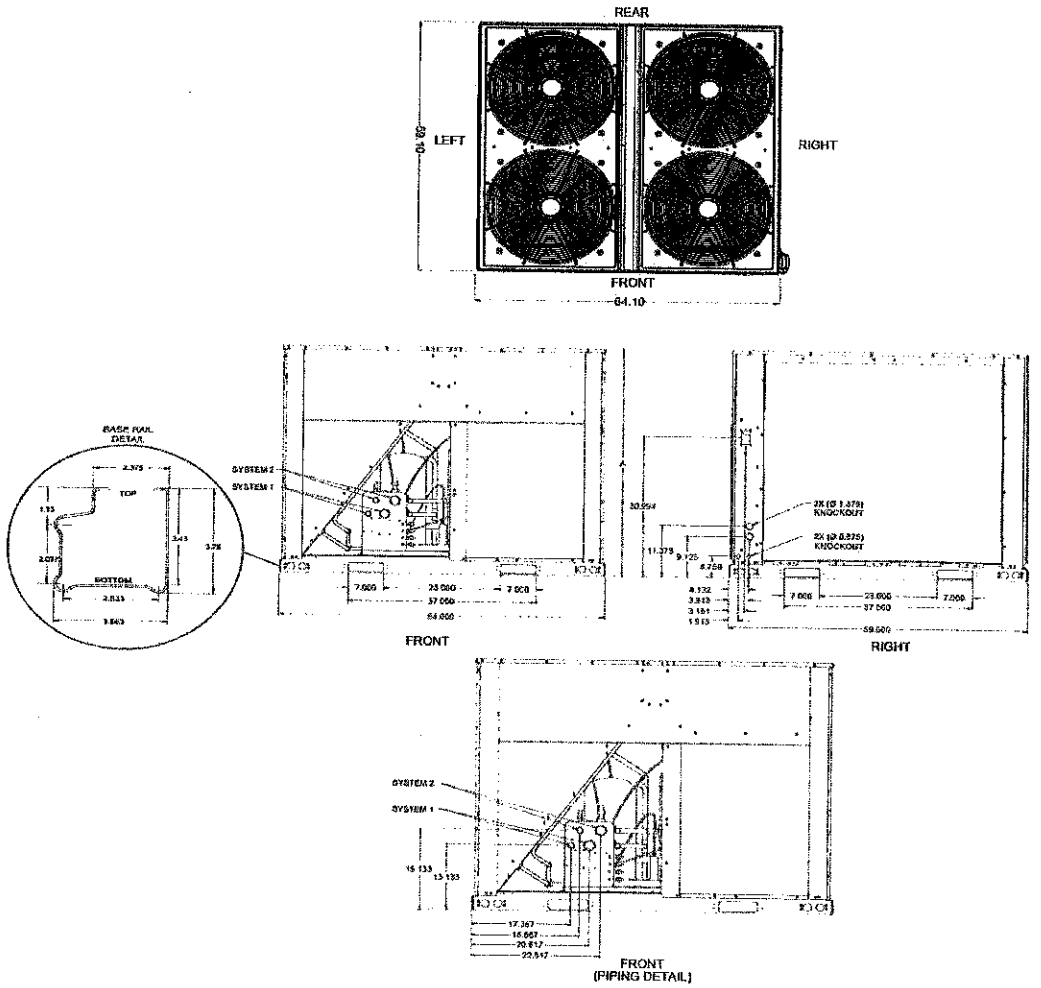
MATERIAL: TYPE NOT APPLICABLE
ENG SPEC NOT APPLICABLE
SIZE
DRG NO. 5883777
REV A
PART NO.
SHT NO 1 OF 1

Project Name: **University of Guam**

Unit Model #: **PC180C00A4QEE4**

Quantity: **1** Tag #: **ACCU-5**

Piping & Connection



Unit Dimensions PC/PD180, PC/PD240, YC/YD180, YC/YD240

Piping And Electrical Connection Sizes (Inches)

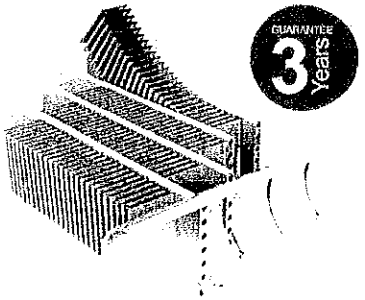
Model	PC090	PE090	PC120	YC090	YE090	YC120	YD120	YC150	YD150
No. refrigeration circuits	1	1	1	1	1	1	2	1	2
Suction line OD (in.)	1 1/8	1 1/8	1 3/8	1 1/8	1 1/8	1 3/8	1 1/8	1 3/8	1 1/8
Liquid line OD (in.)	5/8	5/8	7/8	5/8	5/8	7/8	5/8	7/8	5/8
Power wiring knockout	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8
Control wiring knockout	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8

Model	PC180	PD180	PD240	YC180	YD180	YC240	YD240	YC300
No. refrigeration circuits	1	2	2	1	2	1	2	1
Suction line OD (in.)	1 5/8	1 3/8	1 3/8	1 5/8	1 1/8	1 5/8	1 3/8	1 5/8
Liquid line OD (in.)	7/8	5/8	5/8	7/8	5/8	7/8	5/8	7/8
Power wiring knockout	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8
Control wiring knockout	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8

EXHIBIT 11

NOVATION® Microchannel coils

The ultimate heat exchanger technology.



In 2006, Carrier was the first to introduce microchannel (MCHE) technology in the Commercial Air Conditioning industry. MCHE heat exchangers are entirely made of aluminum. Since 2011, a new generation of microchannel is available: NOVATION® microchannel.

- Superior corrosion resistance, due to one-piece material construction
- Superior mechanical resistance
- Improved reliability assembly, only one automated braze compared to conventional coils
- Proven technology
- Ease of cleaning

Environmental

- Up to 50% refrigerant charge reduction vs. traditional Cu/Al coils
- Better thermal performance vs. Cu/Al coils
- Light weight reducing CO2 environmental impact during transport
- Thinner to reduce air pressure losses by 50% and fan energy consumption
- Reduced fouling maintaining unit performance over the time

EXHIBIT 12

Aluminum Condensing Coils Vs. Copper Condensing Coils: Advise From Phoenix AC Installation Pros

Written by Rm Harrington on . Posted in AC Installation, AC Repair, AC Service, Cooling Tips, Maintenance.

For the Phoenix AC installation industry, the debate concerning aluminum condensing coils versus copper condensing coils could be termed "economic focused." For the Mesa homeowner, the Scottsdale business owner or any other buyer in need of new air conditioning equipment, the debate hinges on how to get the best quality for the least expenditure.

A Note of Qualification For Arizona Air Conditioning Contractors

If you are a Phoenix air conditioning service center, don't let the "economics" comment ruffle your feathers. This article comes in via the viewpoint of a buyer. Industry arguments about copper versus aluminum involve many aspects of technology. From the viewpoint of an Arizona AC contractor, economics is only one component of the debate. However, from the viewpoint of the buyer, all contractors have a primarily sales-orientated end goal.

Buyers expect heating and cooling installation and repair dealers to hedge the details. It's a mindset that comes about due to the competition in the HVAC industry. The pricing, the product favoritism and the value-added sales incentives merely reflect the mindset of new and used car dealers.

Dedicated To Meet The Needs of Inquiring Valley Metro Homeowners

This article is for the benefit of homeowners and business owners throughout the greater Phoenix, Arizona metropolitan area. As such, the text presents both sides of the argument: Which works best, air conditioning with aluminum condensing coils or air conditioning with copper condensing coils.

Even the information presented via governmental and educational resources tend to be tinted by manufacturer economics. Everyone wants to claim the better heating and cooling solution. It's just a matter of how to gain marketing share.

Here at American Cooling and Heating we carry all major brands of heating and cooling equipment, including Amana, Carrier and Trane. We handle units that are crafted with copper condensing coils and units manufactured with aluminum condensing coils. Economics may indeed be our purpose for being in business. Without profit, we would fade away.

However, AC&H strives to meet any customer need or demand. Perhaps the following information will help simplify your choice.

Aluminum Condenser Coils – The Beginning

It began in the 1970s when General Electric was still in the HVAC business. All other AC manufacturers provided condensing units with aluminum fins bonded to copper tube. GE wanted to reduce production expenses. This brought about the introduction of coils with aluminum tube and aluminum fins.

For the most part, this was an industrial solution. Prior to 1980, only around 20% of residential structures had installed air conditioning. AC unit components and AC installation expenses rendered air conditioning as a luxury item. Very few homeowners could afford central heating and cooling.

Then the market shifted. Construction boomed. Inflation invaded. Home values increased and the market for home air conditioning bloomed into a lucrative enterprise.

The use of aluminum coils provided GE with a competitive edge. In no long time, other AC manufacturers began to produce their own version of compatible aluminum coil solutions. GE no longer competes in the HVAC business, but the aluminum tube with aluminum fin condensing coil remains a stable market product.

Drawbacks of Using Aluminum AC Coils

The arguments in this matter fall on both sides of the street. Some of the reasoning can be demonstrated scientifically. Some of the reasoning is merely personal dealer favoritism. From a scientific viewpoint, the following statements are true – providing that all tubing measurements are

identical between the components:

- Copper is superior in strength to aluminum
- Copper is more reliable than aluminum
- Copper is more durable than aluminum
- Copper is easier to maintain than aluminum
- Copper provides better heat transfer characteristics than aluminum
- Aluminum coils damage easier than copper coils
- Aluminum coils are more difficult to clean than copper coils.

However, due to the expense of manufacture and an effort to keep up with the reduced unit pricing associated with units that use aluminum tube coils, the manufacturers of copper-based coil systems have resorted to downsizing the thickness of the copper tubing wall. Thus strength, reliability and durability are relative to the actual components used during the air conditioning construction stage.

Field Maintenance is also often listed as another drawback associated with aluminum tube condensing coils. Some Phoenix AC repair companies complain that leaks in aluminum tubes are more difficult to fix than leaks in copper tubes. The argument contends that aluminum coils cannot be repaired in the field. To the homeowner, this means more downtime. To the AC service center, this means additional expenses when dealing with warranty issues.

Unfortunately, the DOE does not provide statistics pertaining to leaky air conditioning coils – aluminum or copper. The rule is simple: If your unit is low on refrigerant, have trained AC technicians repair the leak, test the repair and then recharge the unit to manufacturer recommendations.

Galvanic Action describes leaks that occur when oxygen reaches the condensing coil at the point where the aluminum meets the copper in the condensing unit. The problem is often considered not repairable. Qualifier: More and more AC repair centers now carry welding rigs capable of welding aluminum. Over the years, the aluminum coil repair process has improved and will likely continue to improve in the future.

Drawbacks of Using Copper AC Condensing Coils

In the earlier years of aluminum condensing coils, Arizona AC contractors tended to favor copper tube with fin coils. However, a change over may be taking place. No matter what other arguments are in place, unit cost remains a primary factor in any AC purchase decision. For example:

- Aluminum coils cost less to manufacture than copper coils

- Due to pliability, copper coils require more material than aluminum coils (even as much as three times the material); this results in higher manufacturing expenses
- Galvanic corrosion is common problem with all copper tubing
- To remain price competitive, new units are shipping with substandard quality coils
- The thinner the copper, the more difficult it is to repair the coil.

Copper is harder to damage than aluminum, provides better heat transfer and is easier to clean. Modern engineering eliminates the majority of galvanic corrosion. The prices of the units continue to remain considerably higher than AC equipment constructed with aluminum condensing coils. Homeowners question the value of the exchange.

Conclusion

Without collected statistics, fears of leakage and early system failure are difficult to substantiate. All-aluminum coils are more fragile than copper tube coils but manufacturers take care of this issue by protecting the units inside a heavy-duty cabinet. This, of course, results in a system that is harder to clean and maintain.

When area consumers call for AC services and semi-annual system tune-ups, they get often get ripped by vendors who provide a less than necessary clean and inspection process. Most Phoenix C installation and repair centers do not properly clean the coils.

American Cooling and Heating goes the extra mile. Our Full System AC Maintenance Service includes opening the case, applying special cleaning fluids to the coils and many other value-added AC tune-up functions. If your system is leaking, contact us today. If you need to install new air conditioning in your home, we service Mesa, Gilbert, Scottsdale and most all other Phoenix area homes and businesses.

A/C Installation, A/C Repair, aluminum condensing coils, copper condensing coils, Phoenix

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Rm Harrington

About Rm Harrington Professional HVAC content writer, equally skilled for communicating with A/C technicians, HVAC product engineers or the home/business buyer in need of reliable A/C related

technicians, HVAC product engineers or the home/business buyer in need of reliable A/C related details. Most valuable skill: The ability to research, comprehend, evaluate and discuss matters of importance to homeowners and the HVAC community, including technical details, system comparisons and best-choice system applications.

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