

Letter of Transmittal

Date: 02/09/2024	
Project Name:	Liberty Collective
Project No:	#12439

To: Teddy Montee Kiesland Development Services 11651 Lebanon Road, Cincinnati, OH 45241

From: - MQE – Justin Ruthen

Submittal Review General Information:

Review and corrections or comments made by Consultant on shop drawings, catalogs, cut sheets, charts, and other items during construction phase submittal review do not relieve Contractor from compliance with requirements of the Contract Documents, for providing a complete and functioning project, nor shall they relieve Contractor from responsibility for deviations or errors of any sort. The Contractor remains responsible for determining the accuracy and completeness of other details such as dimensions and quantities, for substantiating instructions for installations, verifying materials required, obtaining field measurements and related criteria, coordinating work with other disciplines performing work in compliance with the Contract Documents.

Submittal Review Comments:

RTU-3 - Submittal

No Exceptions were taken for all types without specific comment below; for all items noted below – treat as “implement exceptions noted” and no resubmission is required:

- Contractor to coordinate with electrical engineer for lower electrical loads of newly proposed RTU-3.

Submittal Review Stamp:

SUBMITTAL FOR REVIEW	
Project Name Liberty Collective Project Number #12439	
<input type="radio"/> NO EXCEPTIONS TAKEN <input type="radio"/> REVISE AND RESUBMIT	<input checked="" type="radio"/> IMPLEMENT EXCEPTIONS NOTED <input type="radio"/> REVIEWED AS SUBSTITUTION
REVIEWED BY: Justin Ruthen	
REVIEW IS LIMITED TO CHECKING FOR CONFORMANCE WITH THE INFORMATION GIVEN AND THE DESIGN CONCEPT EXPRESSED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR AND/OR CONSTRUCTION MANAGER REMAINS TOTALLY RESPONSIBLE FOR ALL DIMENSIONS, QUANTITIES, CONSTRUCTION METHODS AND MEANS, TECHNIQUES, SEQUENCES IN THE WORK, AND PROCEDURES.	
02/09/2024	

RTU-3 PAGE 4,8
RTU-2 PAGE 15,20
RTU-1 PAGE 28,33

Table Of Contents

Project: Liberty Collective RTU-3 ALT
Prepared By:

02/06/2024
11:11AM

RTU-3 VE	2
Unit Report	3
Certified Drawing	5
Corner Weight Report	11
RTU-2	12
Unit Report	13
Certified Drawing	14
Performance Summary	18
Unit Feature Sheet	22
Spec Sheet	23
RTU-1	24
Unit Report	25
Certified Drawing	26
Performance Summary	30
Unit Feature Sheet	34
Spec Sheet	35

RTU-3 VE

**Tag Cover Sheet
Unit Report
Certified Drawing
Performance Report
Corner Weight**

Unit Report For **RTU-3 VE**

Project: Liberty Collective RTU-3 ALT
 Prepared By:

02/06/2024
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Unit Parameters

Unit Size: **030 (30 Tons)**
 Volts-Phase-Hertz: **208-3-60**
 Supply / Return: **Horizontal/Horizontal**
 Configuration: **Staged Air Volume**
 Evaporator Coil Type: **Standard**
 Heating Capacity: **High Gas Heat, Staged Control, Staged Control, S.S. Heat Exch**
 Heat Option: **Multi-staged**
 4 inch filter: **Selected**
 Greenspeed: **Selected**

Shipping Dimensions

Unit Length: **13' 9"**
 Unit Width: **7' 10"**
 Unit Height: **6' 1"**
 Unit Operating Weight: **4538 lb**
 Unit Shipping Weight: **4575 lb**

***Weights and Dimensions are approximate. Weight does not include curbs and accessories. Approximate dimensions are provided primarily for shipping purposes. For exact dimensions refer to certified drawings.

** Shipping Weight does not include extended leadtime options' weight.

Factory Installed Options

Application Type: **Staged Air Volume**
 Non Fused-Disconnect: **Selected**
 Control Expansion Module: **Selected**
 Digital Compressor: **Selected**

Exhaust/Outdoor Air

OA Intake/Return: **No Exhaust**
 Outdoor Air Intake: **Dry-Bulb Changeover Ultra Low Leak Economizer**

Supply Fan

Supply Fan Type: **Forward Curve**
 Supply Fan Motor HP: **10 HP**

Condenser Coil

Cond. Coil Fin Coating: **MCHX Cond, Al/Cu Evap**

Mixed-Air and Outdoor Air Filters

Mixed-Air Filter Type: **4 in. MERV 7 Pleated**
 Mixed-Air Filter (Quantity) Size: **(5) 20 x 20 x 4, (5) 20 x 24 x 4**
 Outdoor Air Filter (Cleanable Mesh): **(8) 16 x 25 x 2, (4) 20 x 25 x 2**

Warranty Information

First Year - Parts Only (Standard)
 Cooling Start up, first unit
 Heating Start up, first unit
 Gas Heat Exchanger Plan 6-10 Years Parts Only
 Compressor Years 2-5 Parts Only

An uncoated Novation condenser coil was selected for this product. This is based on an installed location with postal code: 45241 and a non-corrosive localized environment.

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

Ordering Information

48V4TH31A1ESA8B31A

Part Number	Description	Quantity
48A8T030ANM551FB	Rooftop Unit With Greenspeed Intelligence	1
	Base Unit	
	Dry-Bulb Changeover Ultra Low Leak Economizer	
	Non-Fused Disconnect	
	115v Convenience Outlet: Field Wired	
	4 inch Filter Track w/ MERV 8 Filters	
	Premium Efficiency 10 HP	
	MCHX w/ Variable Comp	
	Controls Expansion Module (CEM) with Phase Monitor	

Unit Report For RTU-3 VE

Project: Liberty Collective RTU-3 ALT
Prepared By:

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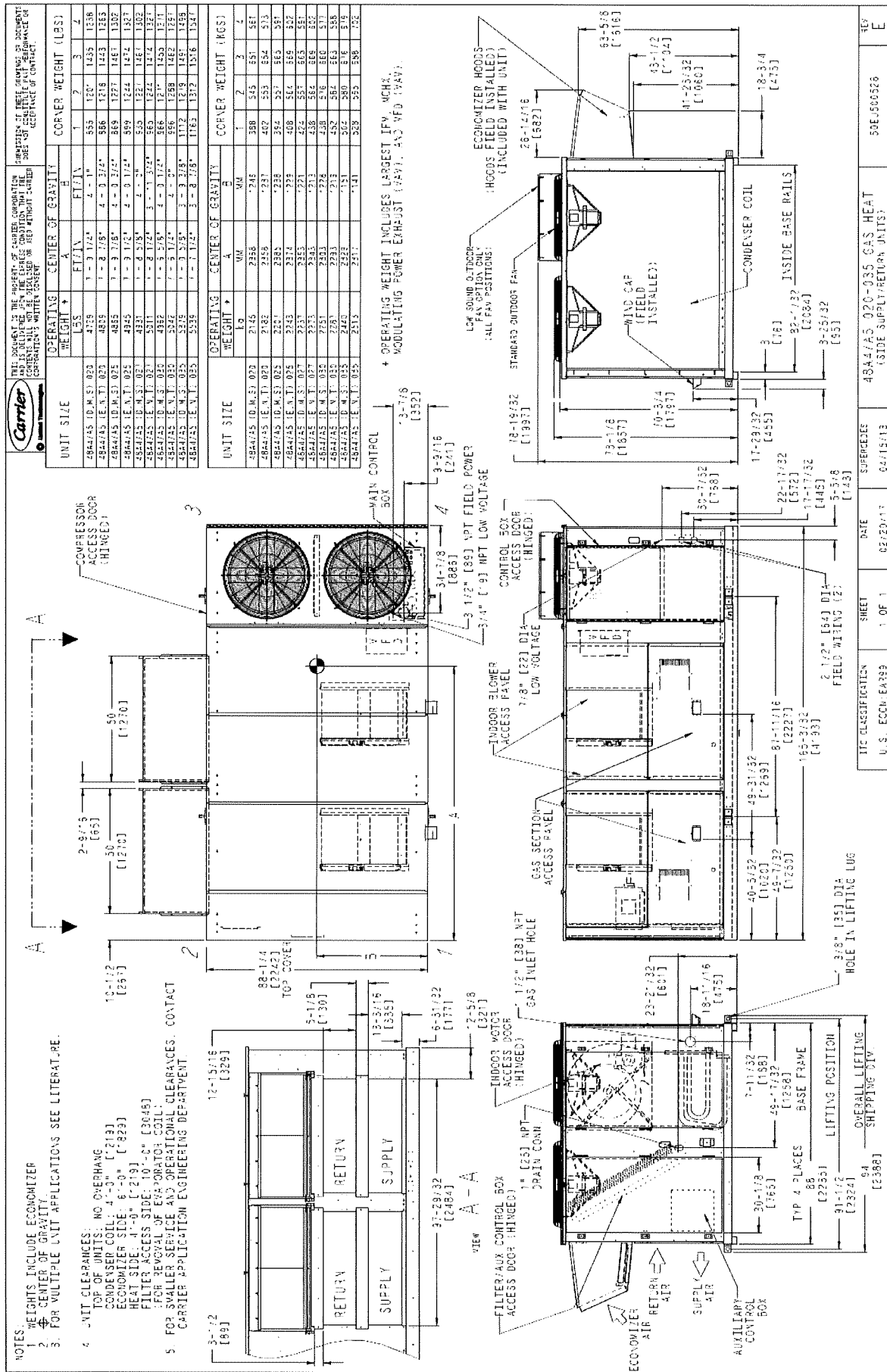
Accessories

Accessory Part #	Description	Quantity
CRBARRLF003A01	Barometric Relief	2
CRRFCURB005A00	14-inch Roof Curb	1
31K4F0520240520204	4" MERV 13 Filter Kit	1

Certified Drawing for RTU-3 VE

Project: Liberty Collective RTU-3 ALT
Prepared By:

02/06/2024
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Certified Draw for RTU-3 VE

Project: Liberty Collective RTU-3 ALT
Prepared By:

02/06/2024
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P.O. BOX 4888
TECHNOLOGIES SYRACUSE, NY
13221

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ROOF CURB DETAIL "A"
(ALL OTHERS)

ROOF CURB DETAIL "B"
(48A2/A3-035 HIGH GAS HEAT ONLY)

NOTES:

- UNLESS OTHERWISE SPECIFIED ALL DIM ARE TO OUTSIDE OF PART.
- ROOF CURB ACCESSORY CRRFCURB060400 IS SHIPPED DISASSEMBLED.
- ALL ROOF CURB PARTS ARE TO BE 14 GA GALVANIZED STL.
- UNITS WITH ELECTRIC HEAT MUST BE INSTALLED WITH 90° ELBOW ON THE SUPPLY DUCT PRIOR TO ANY SUPPLY TAKE OFFS OR BRANCHES.
- DIMENSIONS IN [] ARE MILLIMETERS.

NOTE: TO PREVENT STANDING WATER IN THE DRAIN PAN OF THE INDOOR SECTION, AND THE HEAT EXCHANGERS UNIT CAN ONLY BE PITCHED AS SHOWN.

CONDENSER AND COMPRESSOR END

CONDENSER COMPRESSOR END

DIMENSIONS (DEGREES AND INCHES)		A		B	
DEG.	IN.	mm	DEG.	IN.	mm
1	0	2	9	73	50
					75
					19

UNIT LEVELING TOLERANCES
*FROM EDGE OF UNIT TO HORIZONTAL

BASE RAIL CROSS SECTION TYP 2 SIDES

ROOF CURB CROSS SECTION TYP 4 SIDES

DETAIL "7" SCALE 1:8 TYP 4 CORNERS

ROOF CURB SCALE 1:16

DATE 08/15/07 **SUPERSEDES** 08/20/01

48/50AJ-Y-2-5 020-035 **48EJ500067**

REV F

Performance Summary For RTU-3 VE

Project: Liberty Collective RTU-3 ALT
 Prepared By:

02/06/2024
 11:11AM

Part Number: 48A8T030ANM551FB

Unit Refrigerant: R410A
 EER (AHRI 340/360): 9.8
 IEER (AHRI 340/360): 13.8

Unit Dimensions

Unit Length: 13' 9"
 Unit Width: 7' 10"
 Unit Height: 6' 1"
 Unit Operating Weight: 4538 lb
 Unit Shipping Weight: 4575 lb

*Unit operating weight does not include accessories weight.

Unit

Heating Type: Gas Heat
 Supply/Return: Horizontal/Horizontal
 Application Type: Staged Air Volume
 Voltage: 208-3-60
 Cooling Airflow: 11400 CFM
 Altitude: 482 ft
 Cond. Ent. Air Temp: 93.0 F
 Ent. Air Dry Bulb: 81.4 F
 Ent. Air Wet Bulb: 67.2 F
 Ent. Air Enthalpy: 31.83 BTU/lb
 Lvg. Air Dry Bulb: 59.0 F
 Lvg. Air Wet Bulb: 57.7 F
 Lvg. Air Enthalpy: 25.01 BTU/lb
 Gross Cooling Capacity: 343.73 MBH
 Gross Sensible Clg. Cap: 270.78 MBH
 Compressor Power: 25.4 kW
 Coil Bypass Factor: 0.146
 Refrigerant Charge, Circuit A: 15.1 lb
 Refrigerant Charge, Circuit B: 15.3 lb

Mixed Air

Outdoor Air Airflow: 3600 CFM
 Outdoor Air DB: 93.0 F
 Outdoor Air WB: 74.0 F
 Outdoor Air Htg. Temp.: 5.0 F
 Return Air DB: 76.0 F
 Return Air WB: 64.0 F
 Return Air Htg. Temp.: 70.0 F

Part Load(%) Operation

Cooling Capacity Steps: 12.5-25, 37.5-50, 62.5-75, 87.5-100

Gas Heating Data:

Heating Airflow: 11400 CFM
 Heating Ent. Air Temp: 49.5 F
 Number of Heating Steps: 7
 Gas Input (Max): 525 MBH
 Gas Output: 425.3 MBH
 Gas Output(Min): 106.3 MBH
 Heating Lvg. Air Temp: 84.6 F
 Steady State Eff: 81
 Temp.Rise: 35.2 F
 Capacity Stages - Heat (% Full): 25, 33, 50, 67, 75, 83, 100

Supply Fan Information:

Ext.Static Pressure: 2.05 in wg

Performance Summary For RTU-3 VE

Project: Liberty Collective RTU-3 ALT
Prepared By:

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4 in. Filter Loss:.....	0.02	in wg
Selection Static Pressure:.....	2.07	in wg
Supply Fan RPM:.....	1043	*
Supply Fan BHP:.....	10.73	BHP
Supply Fan Motor HP:.....	10	HP

Field supplied and installed sheave package may be required

Performance Summary For RTU-3 VE

Project: Liberty Collective RTU-3 ALT
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Electrical Data

Voltage Range:	187 - 229
Indoor Fan Motor HP:	10
Indoor Fan Motor FLA:	30.8
Combustion Fan Quantity:	2
Combustion Fan FLA (ea.):	1.1
Power Supply MCA:	143
Power Supply MOCP (Fuse or HACR):	150
Electrical Convenience Outlet:	None
Outdoor Fan [Qty / FLA (ea)]:	2 / 6
Compressor Cir. A, No.1 (RLA / LRA):	23.2 / 164
Compressor Cir. A, No.2 (RLA / LRA):	23.2 / 164
Compressor Cir. B, No.1 (RLA / LRA):	23.2 / 164
Compressor Cir. B, No.2 (RLA / LRA):	23.2 / 164

SCCR, Short Circuit Current Rating: 5kA

An uncoated Novation condenser coil was selected for this product. This is based on an installed location with postal code: 45241 and a non-corrosive localized environment.

Acoustic Information

	Discharge, Lw	Inlet, Lw	Outdoor, Lw
63 Hz	93.0	89.4	0.0
125 Hz	86.5	78.2	0.0
250 Hz	84.7	72.5	0.0
500 Hz	84.6	66.8	0.0
1000 Hz	85.7	66.0	0.0
2000 Hz	82.7	60.5	0.0
4000 Hz	79.0	57.0	0.0
8000 Hz	72.5	51.7	0.0

Discharge / Inlet Duct Sound Power test data rated in accordance with the AHRI 260 Standard.

Calculation methods used in this program are patterned after the ASHRAE Guide; other ASHRAE Publications and the AHRI Acoustical Standards. While a very significant effort has been made to insure the technical accuracy of this program, it is assumed that the user is knowledgeable in the art of system sound estimation and is aware of the tolerances involved in real world acoustical estimation. This program makes certain assumptions as to the dominant sound sources and sound paths which may not always be appropriate to the real system being estimated. Because of this, no assurances can be offered that this software will always generate an accurate sound prediction from user supplied input data. If in doubt about the estimation of expected sound levels in a space, an Acoustical Engineer or a person with sound prediction expertise should be consulted.

Legend

A Sound Power Levels at Unit's Acoustic Center, Lw

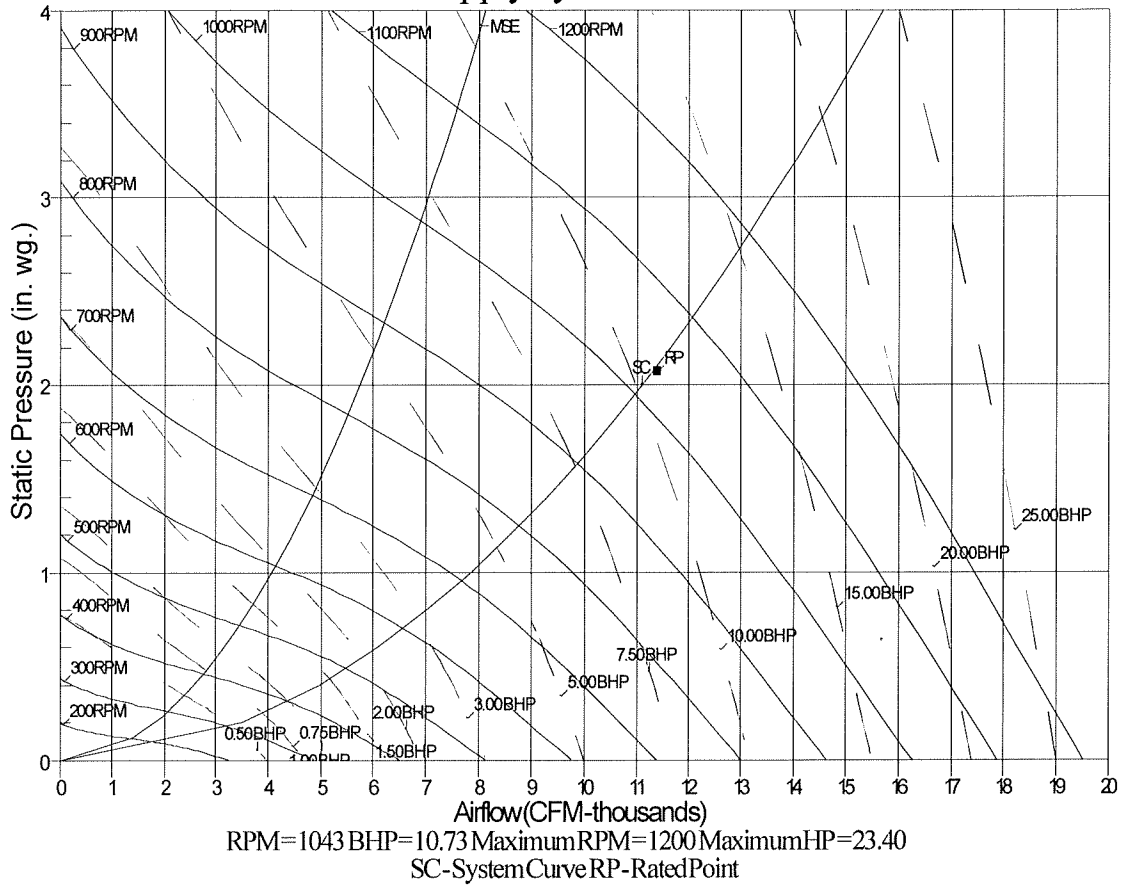
Performance Summary For RTU-3 VE

Project: Liberty Collective RTU-3 ALT
Prepared By:

02/06/2024
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- . . .Weighted Sound Power Levels at Unit's Acoustic Center, LwA
- C Sound Pressure Levels at Specific Distance from Unit, Lp
- D A-Weighted Sound Pressure Levels at Specific Distance from Unit, LpA

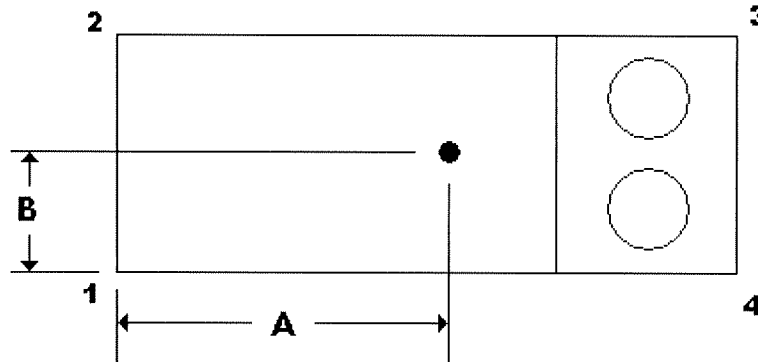
Supply System Curve



Corner Weight / Center of Gravity Report For RTU-3 VE

Project: Liberty Collective RTU-3 ALT
Prepared By:

02/06/2024
11:11AM



Rooftop Unit Part Number: 48A8T030ANM551FB

CG Dimension (A): 7' 9"
CG Dimension (B): 3' 8"

Unit Length: 13' 9"
Unit Width: 7' 10"
Unit Height: 6' 1"
Unit Weight: 4537.8 lb
Unit Shipping Weight: 4575.5 lb

Corner Weight (1): 979.0 lb
Corner Weight (2): 979.0 lb
Corner Weight (3): 1290.0 lb
Corner Weight (4): 1289.8 lb
Total Corner Weight: 4537.8 lb

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Submittal Review Comments:

RTU-2 - Submittal

No Exceptions were taken for all types without specific comment below; for all items noted below – treat as “implement exceptions noted” and no resubmission is required:

Submittal Review Stamp:

SUBMITTAL FOR REVIEW	
Project Name Liberty Collective Project Number #12439	
<input checked="" type="checkbox"/> NO EXCEPTIONS TAKEN <input type="checkbox"/> REVISE AND RESUBMIT	<input type="checkbox"/> IMPLEMENT EXCEPTIONS NOTED <input type="checkbox"/> REVIEWED AS SUBSTITUTION
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02/09/2024	

RTU-2

**Tag Cover Sheet
Unit Report
Certified Drawing
Performance Report
Unit Feature Sheet
Spec Sheet**

Unit Report For RTU-2

Project: Liberty Collective RTU-3 ALT
 Prepared By:

02/06/2024
 11:11AM

Unit Parameters

Unit Model: 48LCE026A7M5-0N1C0

Unit Size: 26 (23 Tons)

Volts-Phase-Hertz: 208-3-60

Heating Type: Gas

Heat Control: Medium Gas Heat

Duct Cfg: Horizontal Supply / Horizontal Return

DX Options: Three stage cooling capacity control with

TXV

Dimensions (ft. in.) & Weight (lb.) ***

Unit Length: 13' 1.75"

Unit Width: 7' 2.375"

Unit Height: 4' 10.5"

Total Operating Weight: 3023 lb

*** Weights and Dimensions are approximate. Weight does not include unit packaging. Approximate dimensions are provided primarily for shipping purposes. For exact dimensions and weights, refer to appropriate product data catalog.

Unit Configuration

- High Static Option - Horizontal Models with VFD controller
- Al/Cu - Al/Cu - Louvered Hail Guards
- Electro Mechanical Controls
- Temp Ultra Low Leak EconoMi\$er w/ Baro relief
- Unpowered Convenience Outlet
- Non-Fused Disconnect
- Standard Packaging

Warranty Information

- 1-Year parts
- 5-Year compressor parts
- 10-Year heat exchanger - Aluminized

No optional warranties were selected.

NOTE: Please see Warranty Catalog 500-089 for explanation of policies and ordering methods.

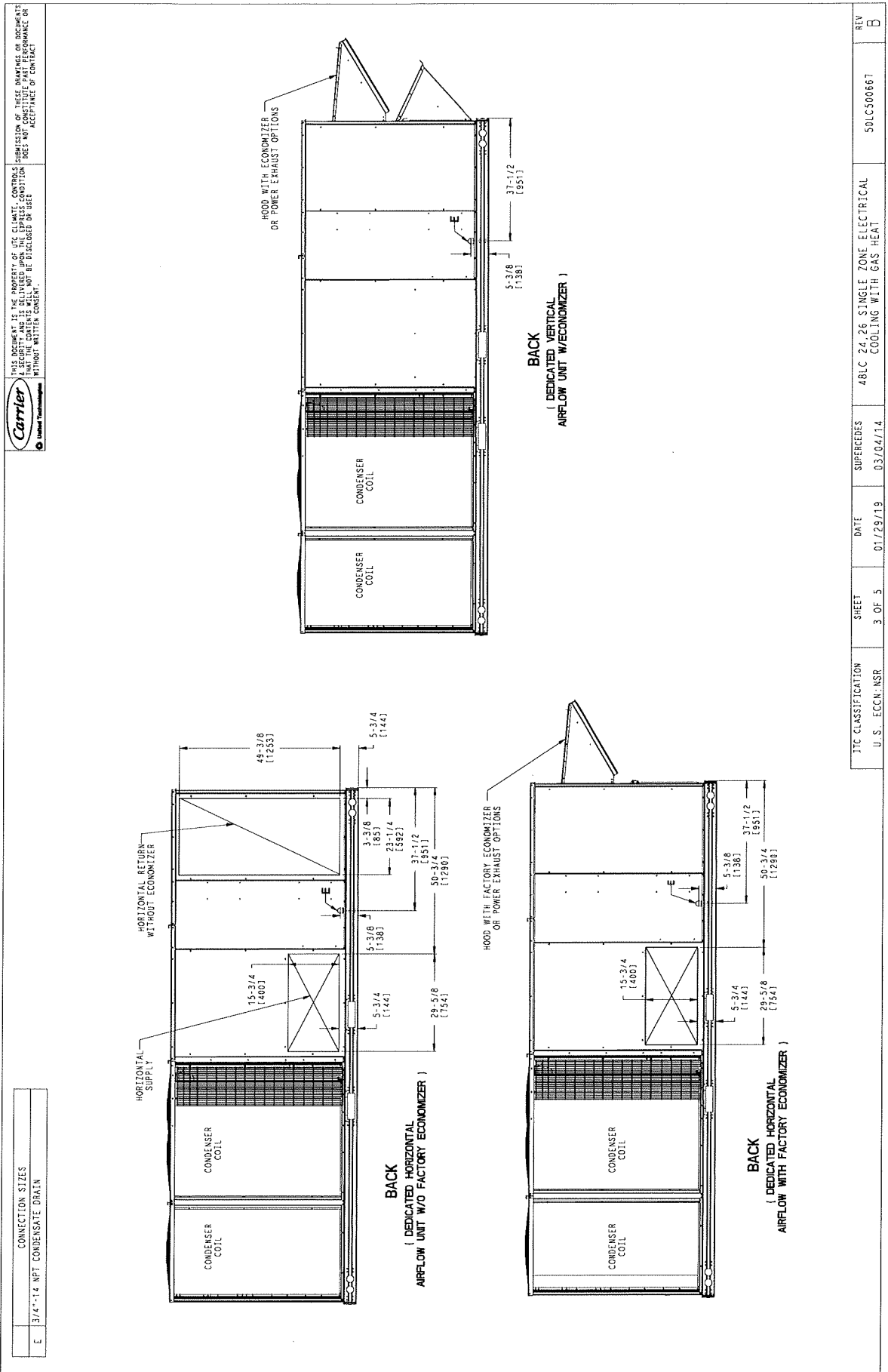
Ordering Information

Part Number	Description	Quantity
48LCE026A7M5-0N1C0	Rooftop Unit	1
	Base Unit	
	High Static Option - Horizontal Models with VFD controller	
	Al/Cu - Al/Cu - Louvered Hail Guards	
	Unpowered Convenience Outlet	
	Non-Fused Disconnect	
	Ultra Low Leak Temp Econo X with baro relief, W7220 control. Meets Calif. Title 24 FDD & Leak Rates	
Field Installed Accessories		
16X25X2-M8-R-P9	16x25x2 MERV-8 replacement air filters	1
CRBARHOD001A00	Barometric Hood	1

Certified Drawing for RTU-2

Project: Liberty Collective RTU-3 ALT
Prepared By:

02/06/2024
11:11AM



ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	REV
U.S. ECCN: NSR	3 OF 5	01/29/19	03/04/14	B
			50LCS00667	

Certified Drawing for RTU-2

Project: Liberty Collective RTU-3 ALT
Prepared By:

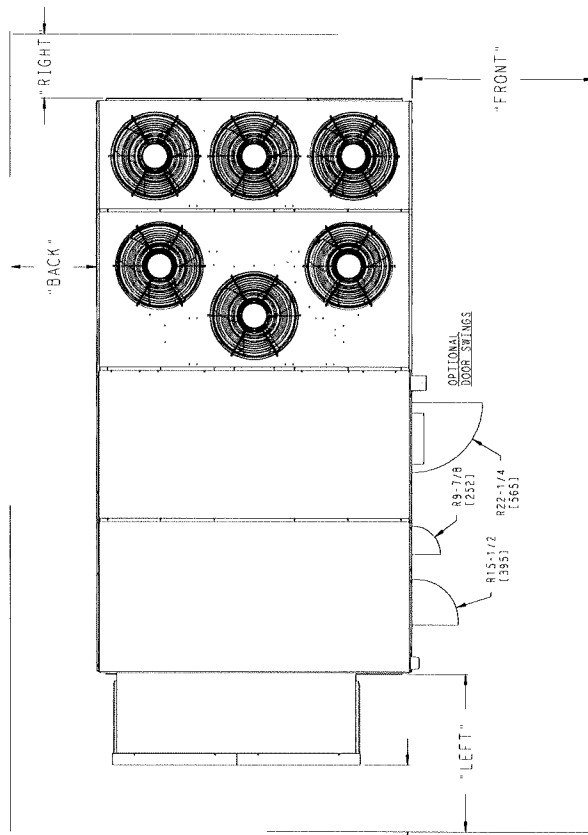
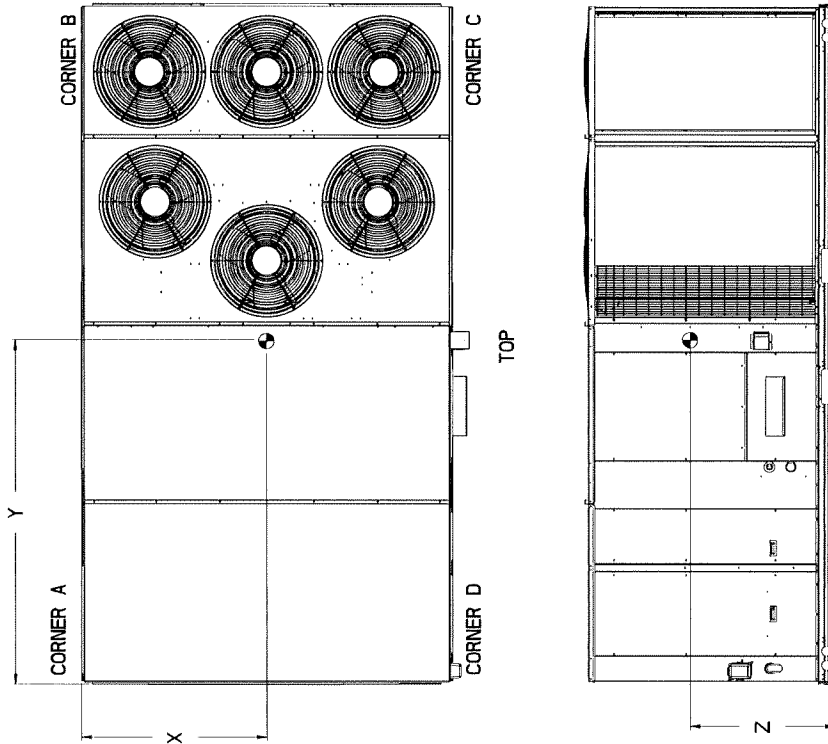
02/06/2024
11:11AM

UNIT	CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.									
	LBS	KG	LBS	KG	LBS	KG	LBS	KG	X	Y								
48LC24	2347	1067.0	2220	1008.9	2585	1175.5	325	148	1219	20	88	1219	79	19	1482	61		
48LC26	2482	1132.6	2556	1163.0	2853	1298.4	319	145	172	1155	70	83	1732	12108	93	19	1482	61

* STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES REFER TO THE PRODUCT DATA CATALOG

Carrier
United Technologies

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NOTES

- CLEARANCE ABOVE THE UNIT TO BE 72"
- FOR ALL MINIMUM CLEARANCES LOCAL CODES OR JURISDICTIONS MAY PREVAIL

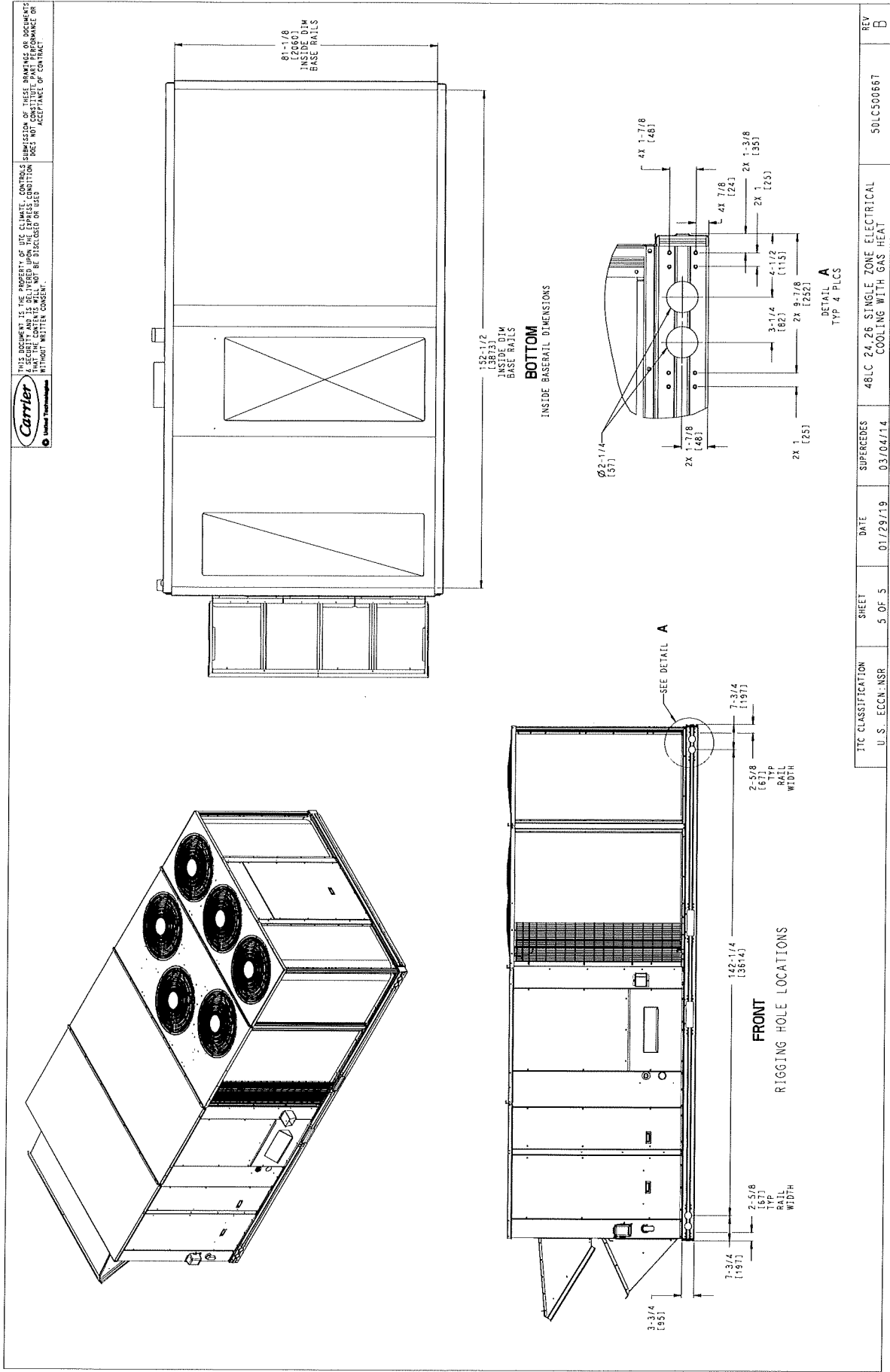
SURFACE	CLEARANCE	
	SERVICE WITH CONDUCTIVE BARRIER	SERVICE WITH NONCONDUCTIVE BARRIER
FRONT	48 [1219mm]	36 [914mm]
LEFT	48 [1219mm]	42 [1067mm]
BACK	42 [1067mm]	36 [914mm]
LEFT WITH HOOD	36 [914mm]	36 [914mm]
RIGHT	36 [914mm]	36 [914mm]
TOP	72 [1829mm]	72 [1829mm]
OPERATING CLEARANCE	18 [457mm]	18 [457mm]

ITC CLASSIFICATION	SHEET	DATE	REV
U.S. ECCN: NSR	4 OF 5	01/29/19	B
48LC 24-36 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT			50LC500667

Certified Drawing for RTU-2

Project: Liberty Collective RTU-3 ALT
Prepared By:

02/06/2024
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ITC CLASSIFICATION U.S. ECCN: NSR	SHEET 5 OF 5	DATE 01/29/19	SUPERSEDES 03/04/14	REV B
48LC 24, 26 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT				50LCS00667

Performance Summary For RTU-2

Project: Liberty Collective RTU-3 ALT
 Prepared By:

02/06/2024
 11:11AM

Part Number: 48LCE026A7M5-0N1C0

ARI EER: 10.11
 IEER: 16.1

Base Unit Dimensions

Unit Length: 157.8 in
 Unit Width: 86.4 in
 Unit Height: 58.5 in

Operating Weight

Base Unit Weight: 2492 lb
 Medium Gas Heat: 90 lb
 Al/Cu - Al/Cu - Louvered Hail Guards: 150 lb
 Temp Ultra Low Leak Economizer w/ Baro relief: 246 lb
 Unpowered Convenience Outlet: 5 lb
 Non-Fused Disconnect: 15 lb

Accessories

Barometric Hood: 25 lb

 Total Operating Weight: 3023 lb

Unit

Unit Voltage-Phase-Hertz: 208-3-60
 Air Discharge: Horizontal
 Fan Drive Type: Belt Drive
 Actual Airflow: 9200 CFM
 Site Altitude: 482 ft

Cooling Performance

Condenser Entering Air DB: 93.0 F
 Evaporator Entering Air DB: 81.3 F
 Evaporator Entering Air WB: 67.4 F
 Entering Air Enthalpy: 32.01 BTU/lb
 Evaporator Leaving Air DB: 59.4 F
 Evaporator Leaving Air WB: 57.6 F
 Evaporator Leaving Air Enthalpy: 24.95 BTU/lb
 Gross Cooling Capacity: 287.53 MBH
 Gross Sensible Capacity: 214.02 MBH
 Compressor Power Input: 20.41 kW
 Coil Bypass Factor: 0.142

Mixed Air

Outdoor Air Airflow: 2885 CFM
 Outdoor Air DB: 93.0 F
 Outdoor Air WB: 74.0 F
 Outdoor Air Htg. Temp.: 5.0 F
 Return Air DB: 76.0 F
 Return Air WB: 64.0 F
 Return Air Htg. Temp.: 70.0 F

Heating Performance

Heating Airflow: 9200 CFM
 Entering Air Temp: 49.6 F
 Leaving Air Temp: 75.3 F
 Gas Heating Input Capacity: 248.0 / 310.0 MBH
 Gas Heating Output Capacity: 200.0 / 251.0 MBH
 Temperature Rise: 25.7 F
 Thermal Efficiency (%): 81.0

Supply Fan

Performance Summary For RTU-2

Project: Liberty Collective RTU-3 ALT
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Advanced Acoustics Parameters

1. Unit height above ground:.....30.0 ft
2. Horizontal distance from unit to receiver:.....50.0 ft
3. Receiver height above ground:.....5.7 ft
4. Height of obstruction:.....0.0 ft
5. Horizontal distance from obstruction to receiver:.....0.0 ft
6. Horizontal distance from unit to obstruction:.....0.0 ft

Detailed Acoustics Information

Octave Band Center Freq. Hz	63	125	250	500	1k	2k	4k	8k	Overall
A	97.1	88.3	84.4	83.3	80.7	77.4	73.4	67.3	98.1 Lw
B	70.9	72.2	75.8	80.1	80.7	78.6	74.4	66.2	85.9 LwA
C	64.7	55.9	52.0	50.9	48.3	45.0	41.0	34.9	65.7 Lp
D	38.5	39.8	43.4	47.7	48.3	46.2	42.0	33.8	53.5 LpA

Legend

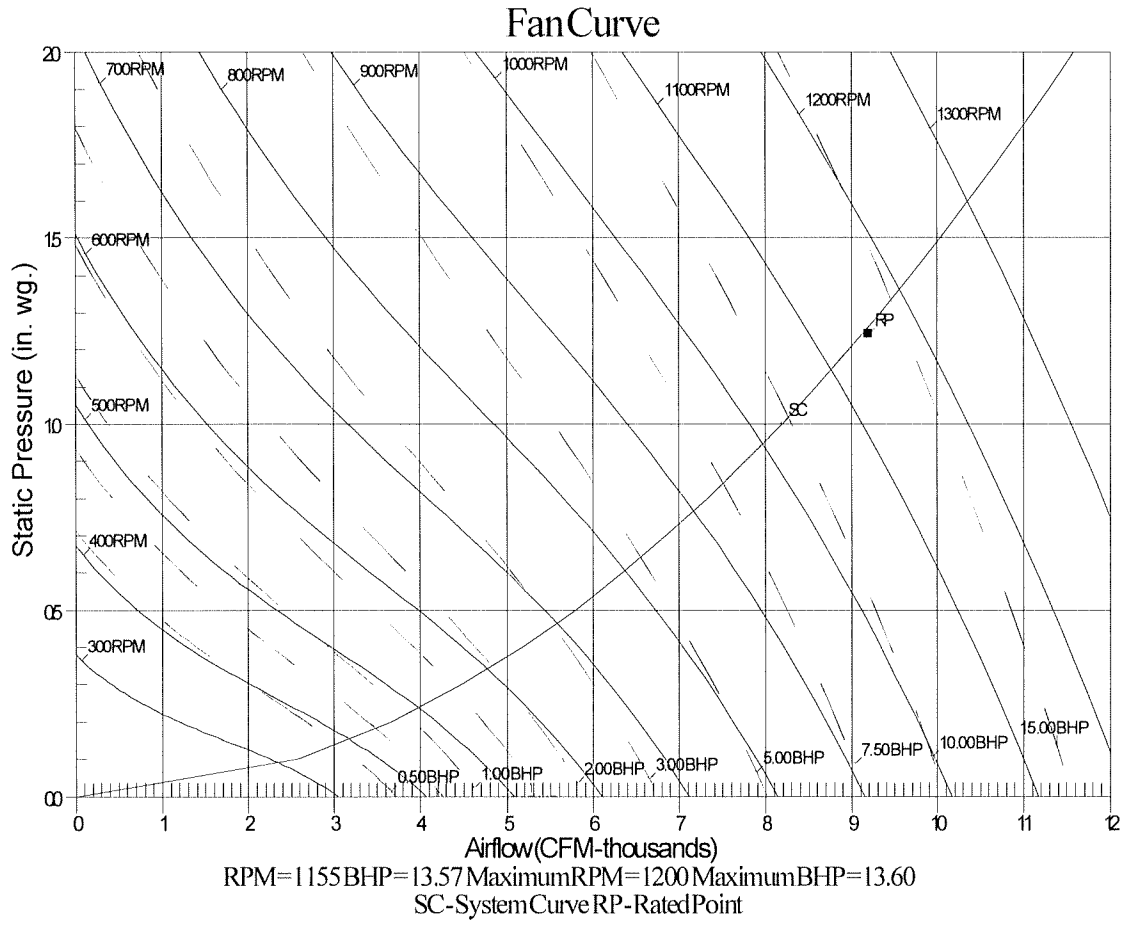
- A Sound Power Levels at Unit's Acoustic Center, Lw
- B A-Weighted Sound Power Levels at Unit's Acoustic Center, LwA
- C Sound Pressure Levels at Specific Distance from Unit, Lp
- D A-Weighted Sound Pressure Levels at Specific Distance from Unit, LpA

Calculation methods used in this program are patterned after the ASHRAE Guide; other ASHRAE Publications and the AHRI Acoustical Standards. While a very significant effort has been made to insure the technical accuracy of this program, it is assumed the user is knowledgeable in the art of system sound estimation and is aware of the tolerances involved in real world acoustical estimation. This program makes certain assumptions as to the dominant sound sources and sound paths which may not always be appropriate to the real system being estimated. Because of this, no assurances can be offered that this software will always generate an accurate sound prediction from user supplied input data. If in doubt about the estimation of expected sound levels in a space, an Acoustical Engineer or a person with sound prediction expertise should be consulted.

Performance Summary For RTU-2

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Unit Feature Sheet for RTU-2

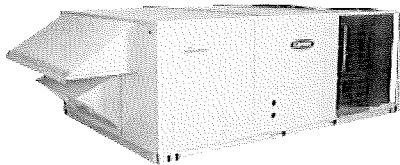
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 WeatherExpert® - 48LC

PACKAGED ROOFTOP GAS HEATING/ELECTRIC COOLING UNITS
12.5, 15, 17.5, 20 and 23 TONS



Optional Economizer/PE Shown

WeatherExpert® - 48LC

48LC units are ultra high-efficiency, single-packaged electric cooling, gas heating units. Units utilize three stages of cooling capacity control with matching indoor fan motor speed control. All models are available with belt drive indoor fan motors with Variable Frequency Drive (VFD) speed controller and Direct Dive - ECM outdoor fan motor. Models offer standard electro mechanical controls that use Carrier's Comfort Control Logic and LED indicators.

All units are factory tested in both heating and cooling modes, and rated in accordance with AHRI Standards 340/360.



STANDARD FEATURES INCLUDE:

- Puron® (R-410A) HFC refrigerant factory charged
- IEER's up to 19.1 and EER's up to 12.5
- ASHRAE 90.1 compliant, Energy Star qualified
- Meets or exceeds CEE tier II performance criteria
- Three stage cooling capacity control with crankcase heaters
- Single refrigerant circuit with full face activated evaporator coil.
- Belt drive indoor fan and pulley system with Variable Frequency Drive(VFD) motor controller on all models
- High efficient ECM outdoor fan motor
- Sound levels as low as 84 dB.
- Precision sized TXV refrigerant metering devices
- Exclusive non-corrosive composite condensate pan in accordance with ASHRAE Standard 62, sloping design, side or center drain
- Standard ambient cooling operation down to 40°F (4°C) with lower operation range with integrated economizer. SystemVu™ controls allows operation down to 0°F (-18°C). Units operate to 125°F (52°C).
- Designed in accordance with UL Standard 1995
- High performance 5/16" diameter, internally enhanced copper tube / aluminum fin condenser and evaporator coils
- Pre-painted exterior panels and primer-coated interior panels tested to 500 hours salt spray protection
- Exclusive IGC solid-state control for on-board diagnostics with LED error code designation burner control logic
- Induced draft gas heat combustion design
- Low pressure and high pressure switch protected.

MAINTENANCE FEATURES:

- Access panels with easy grip handles and tool-less filter access door
- Innovative easy starting, no-strip screws on unit access panels
- Two-inch disposable return air filters

INSTALLATION FEATURES:

- Thru-the-bottom power entry capability
- Single point gas and electric connections
- Full perimeter base rail with built-in rigging adapters and fork slots
- Dedicated vertical and horizontal airflow models available as factory option. No special kits required

STANDARD LIMITED PARTS WARRANTY:

- 10-year parts heat exchanger – 16-year stainless steel option
- 5-year compressor parts, 1-year parts, 3-year SystemVu™
- Many optional upgrades available

OPTIONS/ACCY INCLUDE BUT ARE NOT LIMITED TO:

- Supply and Return air smoke detectors, high static motors
- Louvered condenser coil guards and coil coating options
- Ultra Low Leak Economizer and convenience outlet options
- Stainless Steel heat exchanger
- HACR breaker or non-fused disconnect switch
- Hinged access panels with quick turn latches and lift tabs
- Patented Humidi-Mizer™ adaptive dehumidification system
- RTU Open multi-protocol DDC controller
- SystemVu Controls:
 - Large full text – multi line display
 - USB Flash Port for data transfer
 - Built in iVu®, CCH and BACnet®
 - Refrigerant pressure from display
 - Quick LED Status – Run, Alert, Fault
 - Conventional Stat or Sensor capabilities
 - Historical component runtime and starts
 - Supply Air Tempering
 - Equipment / System Touch Compatibility
 - Demand Limiting and ZS Sensor Compatibility

Performance Summary For RTU-2

Project: Liberty Collective RTU-3 ALT
 Prepared By:

02/06/2024
 11:11AM

External Static Pressure:	1.00	in wg
Options / Accessories Static Pressure		
Economizer:	0.10	in wg
MERV-8 Filter Kit:	0.14	in wg
Application External Static (ESP + Unit Opts/Acc.):	1.24	in wg
Fan RPM:	1155	
Fan Power:	13.57	BHP
NOTE: Selected IFM RPM Range: 948 - 1190		

Selection includes construction throwaway filter into the base fan curve. This filter is not MERV Rated.

Filter pressure drop assumes a clean filter and is intended to be an estimate based on available supplier data. The actual pressure drop the unit experiences may vary due to alternate suppliers or filter loading over time.

Electrical Data

Voltage Range:	187 - 253	
Compressor #1 RLA:	30.1	
Compressor #1 LRA:	225	
Compressor #2 RLA:	51.2	
Compressor #2 LRA:	300	
Indoor Fan Motor Type:	HIGH	
Indoor Fan Motor FLA (Total):	37.3	
Combustion Fan Motor FLA (ea):	0.52	
Power Supply MCA:	141	
Power Supply MOCP (Fuse or HACR):	175	
Disconnect Size FLA:	147	
Disconnect Size LRA:	743	
Electrical Convenience Outlet:	None	
Outdoor Fan [Qty / FLA (ea)]:	6 / 1.6	

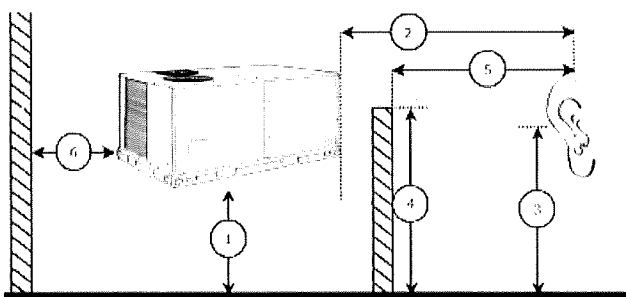
Control Panel SCCR: 5kA RMS at Rated Symmetrical Voltage

Acoustics

Sound Power Levels, db re 10E-12 Watts

	Discharge	Inlet	Outdoor
63 Hz	97.3	99.0	97.1
125 Hz	92.3	81.1	88.3
250 Hz	85.1	72.9	84.4
500 Hz	84.3	64.0	83.3
1000 Hz	79.3	59.1	80.7
2000 Hz	77.4	56.2	77.4
4000 Hz	76.7	49.4	73.4
8000 Hz	69.5	39.0	67.3
A-Weighted	86.5	74.4	86.0

Advanced Acoustics



Spec Sheet for RTU-2

Project: Liberty Collective RTU-3 ALT
Prepared By:

02/06/2024
11:11AM

Letter of Transmittal

Date: **02/09/2024**

Project Name: Liberty Collective
 Project No: #12439

To:
 Teddy Montee
 Kiesland Development Services
 11651 Lebanon Road, Cincinnati, OH 45241

From:
 - MQE – Justin Ruthen

Submittal Review General Information:

Review and corrections or comments made by Consultant on shop drawings, catalogs, cut sheets, charts, and other items during construction phase submittal review do not relieve Contractor from compliance with requirements of the Contract Documents, for providing a complete and functioning project, nor shall they relieve Contractor from responsibility for deviations or errors of any sort. The Contractor remains responsible for determining the accuracy and completeness of other details such as dimensions and quantities, for substantiating instructions for installations, verifying materials required, obtaining field measurements and related criteria, coordinating work with other disciplines and performing work in compliance with the Contract Documents.

Submittal Review Comments:

RTU-1 - Submittal

No Exceptions were taken for all types without specific comment below; for all items noted below – treat as “implement exceptions noted” and no resubmission is required:

Submittal Review Stamp:

SUBMITTAL FOR REVIEW	
Project Name Liberty Collective	
Project Number #12439	
<input checked="" type="checkbox"/> NO EXCEPTIONS TAKEN	<input type="checkbox"/> IMPLEMENT EXCEPTIONS NOTED
<input type="checkbox"/> REVISE AND RESUBMIT	<input type="checkbox"/> REVIEWED AS SUBSTITUTION
REVIEWED BY: Justin Ruthen	
REVIEW IS LIMITED TO CHECKING FOR CONFORMANCE WITH THE INFORMATION GIVEN AND THE DESIGN CONCEPT EXPRESSED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR AND/OR CONSTRUCTION MANAGER REMAINS TOTALLY RESPONSIBLE FOR ALL DIMENSIONS, QUANTITIES, CONSTRUCTION METHODS AND MEANS, TECHNIQUES, SEQUENCES IN THE WORK, AND PROCEDURES.	
02/09/2024	

RTU-1

**Tag Cover Sheet
Unit Report
Certified Drawing
Performance Report
Unit Feature Sheet
Spec Sheet**

Unit Report For RTU-1

Project: Liberty Collective RTU-3 ALT
 Prepared By:

02/06/2024
 11:11AM

Unit Parameters

Unit Model: 48LCE020A7M5-0N1C0
 Unit Size: 20 (17.5 Tons)
 Volts-Phase-Hertz: 208-3-60
 Heating Type: Gas
 Heat Control: Medium Gas Heat
 Duct Cfg: Horizontal Supply / Horizontal Return
 DX Options: Three stage cooling capacity control with TXV

Dimensions (ft. in.) & Weight (lb.) ***

Unit Length: 11' 9.5"
 Unit Width: 7' 2.375"
 Unit Height: 4' 10.5"
 Total Operating Weight: 2732 lb

*** Weights and Dimensions are approximate. Weight does not include unit packaging. Approximate dimensions are provided primarily for shipping purposes. For exact dimensions and weights, refer to appropriate product data catalog.

Unit Configuration

High Static Option - Horizontal Models with VFD controller
 Al/Cu - Al/Cu - Louvered Hail Guards
 Electro Mechanical Controls
 Temp Ultra Low Leak EconoMi\$er w/ Baro relief
 Unpowered Convenience Outlet
 Non-Fused Disconnect
 Standard Packaging

Warranty Information

1-Year parts
 5-Year compressor parts
 10-Year heat exchanger - Aluminized

No optional warranties were selected.

NOTE: Please see Warranty Catalog 500-089 for explanation of policies and ordering methods.

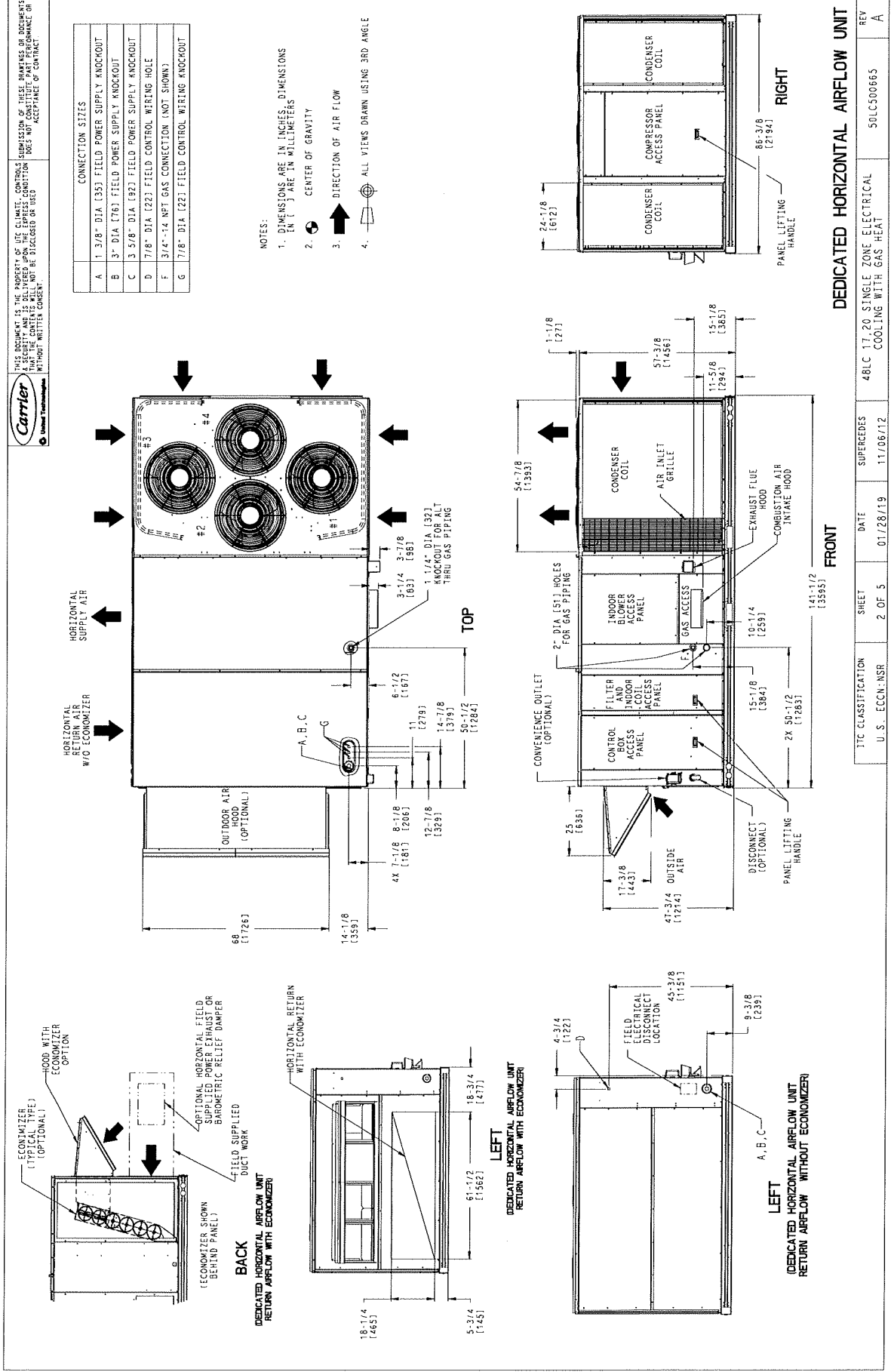
Ordering Information

Part Number	Description	Quantity
48LCE020A7M5-0N1C0	Rooftop Unit	1
	Base Unit	
	High Static Option - Horizontal Models with VFD controller	
	Al/Cu - Al/Cu - Louvered Hail Guards	
	Unpowered Convenience Outlet	
	Non-Fused Disconnect	
	Ultra Low Leak Temp Econo X with baro relief, W7220 control. Meets Calif. Title 24 FDD & Leak Rates	
Field Installed Accessories		
CRBARHOD001A00	Barometric Hood	1
16X25X2-M13-R-P9	16x25x2 MERV-13 replacement air filters	1

Certified Drawing for RTU-1

Project: Liberty Collective RTU-3 ALT
Prepared By:

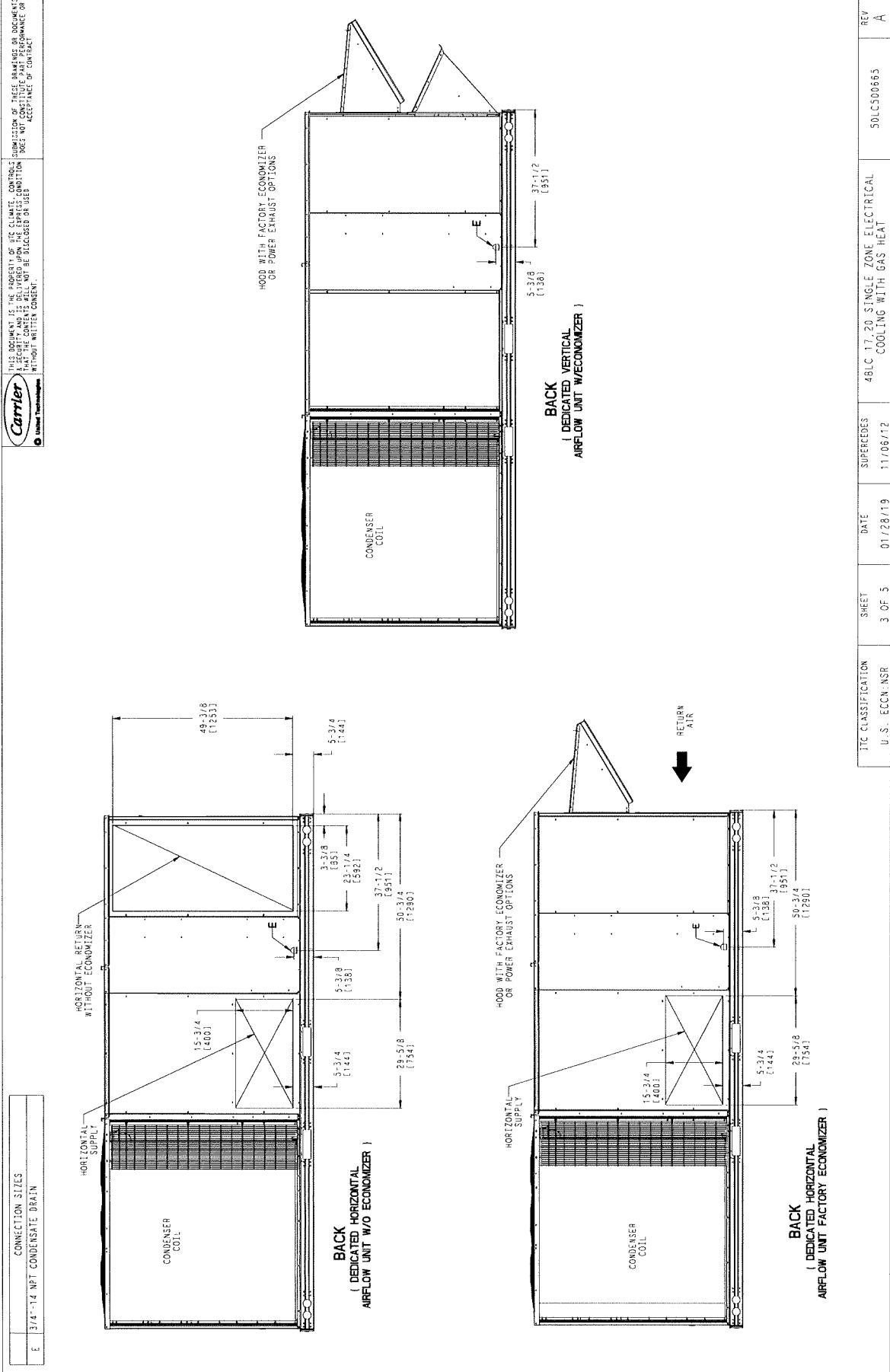
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Certified Drawing for RTU-1

Project: Liberty Collective RTU-3 ALT
Prepared By:

02/06/2024
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ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	48C 1.7.20 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT	REV
U.S. ECCN: NSR	3 OF 5	01/28/19	11/08/12	50LCS00865	A

Certified Drawing for RTU-1

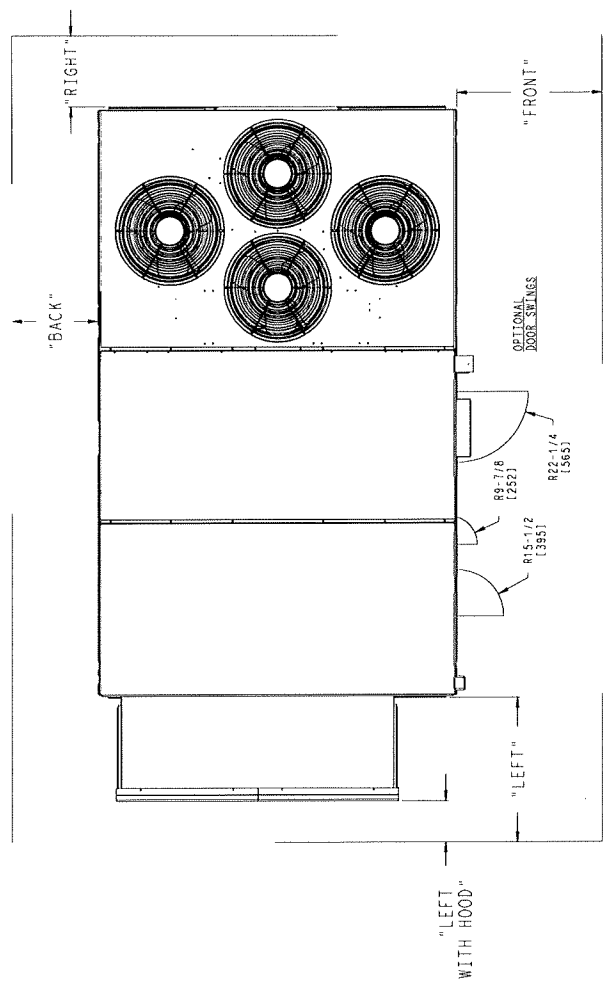
Project: Liberty Collective RTU-3 ALT
Prepared By:

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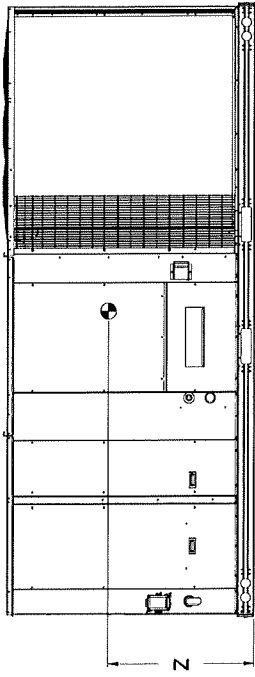
UNIT	CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C. G.				
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z		
48LC17	2085	952	543	247	519	236	511	232	439	199	38 1/2 [977]	76 [1930]	19 [482]
48LC20	2281	1000	570	259	664	302	536	244	481	209	38 1/2 [977]	76 [1930]	19 [482]

* STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES REFER TO THE PRODUCT DATA CATALOG.

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NOTES:
1. CLEARANCE ABOVE THE UNIT TO BE 72"
2. FOR ALL MINIMUM CLEARANCES LOCAL CODES OR JURISDICTIONS MAY PREVAIL



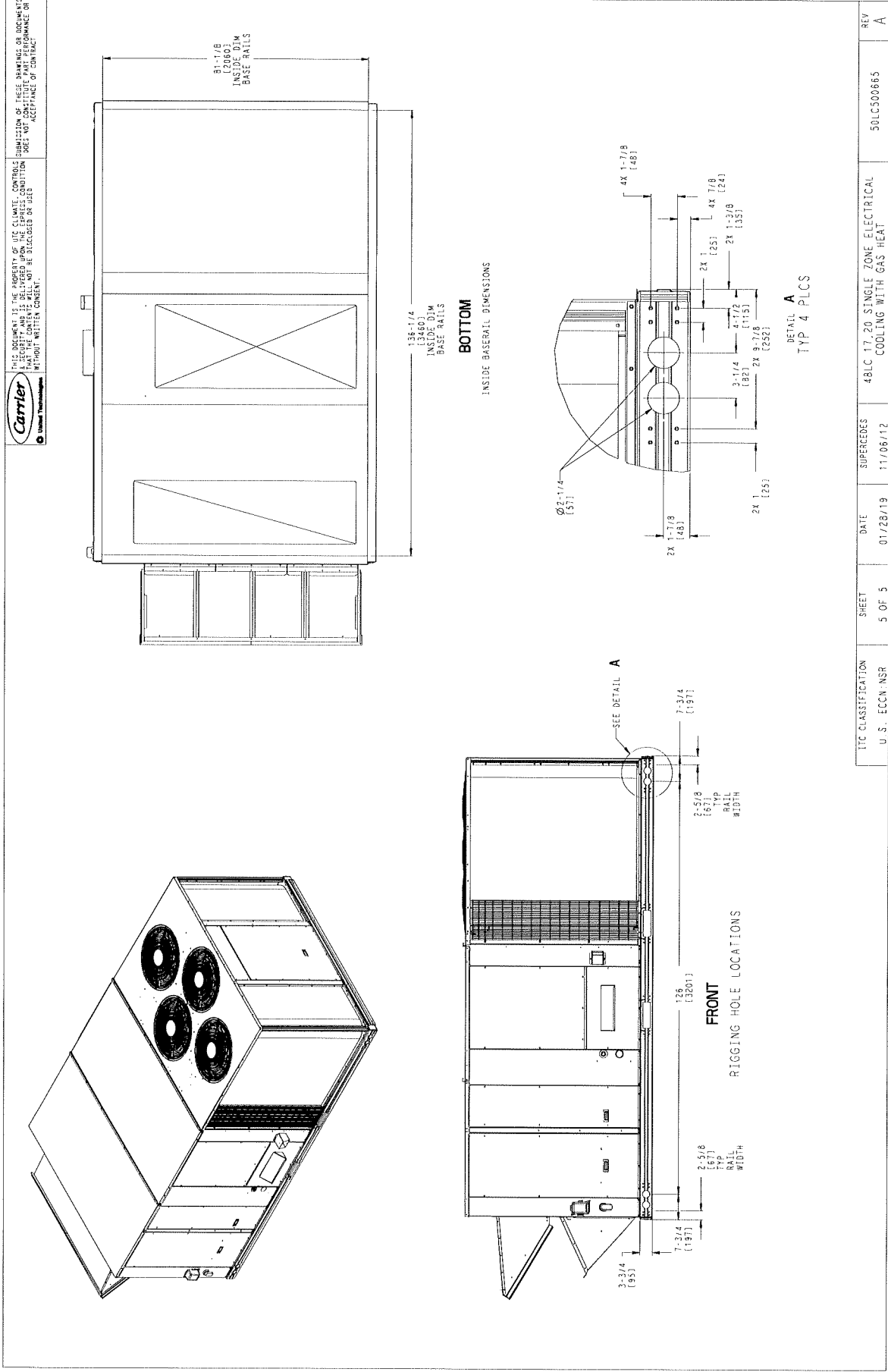
SURFACE	CLEARANCE		
	SERVICE WITH CONDUCTIVE BARRIER	SERVICE WITH NONCONDUCTIVE BARRIER	OPERATING CLEARANCE
FRONT	48 [1219mm]	36 [914mm]	18 [457mm]
LEFT	48 [1219mm]	42 [1067mm]	18 [457mm]
BACK	42 [1067mm]	36 [914mm]	18 [457mm]
LEFT WITH HOOD	36 [914mm]	36 [914mm]	18 [457mm]
RIGHT	36 [914mm]	36 [914mm]	18 [457mm]
TOP	72 [1829mm]	72 [1829mm]	72 [1829mm]

ITC CLASSIFICATION	SHEET	DATE	REV
U. S. ECCN: NSR	4 OF 5	01/28/19	A
SUPERCEDES			
48LC 17, 20 SINGLE TONE, ELECTRICAL COOLING WITH GAS HEAT			50LC500665

Certified Drawing for RTU-1

Project: Liberty Collective RTU-3 ALT
Prepared By:

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ITC CLASSIFICATION U. S. ECN. NSR	SHEET 5 OF 5	DATE 01/28/19	SUPERCEDES 11/05/12	48LC 17.20 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT	50LC500665	REV A
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Performance Summary For RTU-1

Project: Liberty Collective RTU-3 ALT
 Prepared By:

02/06/2024
 11:11AM

Part Number: 48LCE020A7M5-0N1C0

ARI EER: 11.20
 IEER: 16.8

Base Unit Dimensions

Unit Length: 141.5 in
 Unit Width: 86.4 in
 Unit Height: 58.5 in

Operating Weight

Base Unit Weight: 2201 lb
 Medium Gas Heat: 90 lb
 Al/Cu - Al/Cu - Louvered Hail Guards: 150 lb
 Temp Ultra Low Leak EconoMi\$er w/ Baro relief: 246 lb
 Unpowered Convenience Outlet: 5 lb
 Non-Fused Disconnect: 15 lb

Accessories

Barometric Hood: 25 lb

Total Operating Weight: 2732 lb

Unit

Unit Voltage-Phase-Hertz: 208-3-60
 Air Discharge: Horizontal
 Fan Drive Type: Belt Drive
 Actual Airflow: 7000 CFM
 Site Altitude: 482 ft

Cooling Performance

Condenser Entering Air DB: 93.0 F
 Evaporator Entering Air DB: 79.9 F
 Evaporator Entering Air WB: 66.5 F
 Entering Air Enthalpy: 31.33 BTU/lb
 Evaporator Leaving Air DB: 58.3 F
 Evaporator Leaving Air WB: 57.2 F
 Evaporator Leaving Air Enthalpy: 24.69 BTU/lb
 Gross Cooling Capacity: 205.72 MBH
 Gross Sensible Capacity: 161.19 MBH
 Compressor Power Input: 13.84 kW
 Coil Bypass Factor: 0.070

Mixed Air

Outdoor Air Airflow: 1625 CFM
 Outdoor Air DB: 93.0 F
 Outdoor Air WB: 74.0 F
 Outdoor Air Htg. Temp.: 5.0 F
 Return Air DB: 76.0 F
 Return Air WB: 64.0 F
 Return Air Htg. Temp.: 70.0 F

Heating Performance

Heating Airflow: 7000 CFM
 Entering Air Temp: 54.9 F
 Leaving Air Temp: 88.7 F
 Gas Heating Input Capacity: 248.0 / 310.0 MBH
 Gas Heating Output Capacity: 200.0 / 251.0 MBH
 Temperature Rise: 33.8 F
 Thermal Efficiency (%): 81.0

Supply Fan

Performance Summary For RTU-1

Project: Liberty Collective RTU-3 ALT
 Prepared By:

02/06/2024
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External Static Pressure:	1.07	in wg
Options / Accessories Static Pressure		
Economizer:	0.07	in wg
MERV-13 Filter Kit:	0.16	in wg
Application External Static (ESP + Unit Opts/Acc.):	1.30	in wg
Fan RPM:	1012	
Fan Power:	8.64	BHP
NOTE:	Selected IFM RPM Range: 872 - 1053	

Selection includes construction throwaway filter into the base fan curve. This filter is not MERV Rated.

Filter pressure drop assumes a clean filter and is intended to be an estimate based on available supplier data. The actual pressure drop the unit experiences may vary due to alternate suppliers or filter loading over time.

Electrical Data

Voltage Range:	187 - 253	
Compressor #1 RLA:	25	
Compressor #1 LRA:	164	
Compressor #2 RLA:	27.6	
Compressor #2 LRA:	191	
Indoor Fan Motor Type:	HIGH	
Indoor Fan Motor FLA (Total):	28	
Combustion Fan Motor FLA (ea):	0.52	
Power Supply MCA:	92.8	
Power Supply MOCP (Fuse or HACR):	100	
Disconnect Size FLA:	99	
Disconnect Size LRA:	525	
Electrical Convenience Outlet:	None	
Outdoor Fan [Qty / FLA (ea)]:	4 / 1.3	

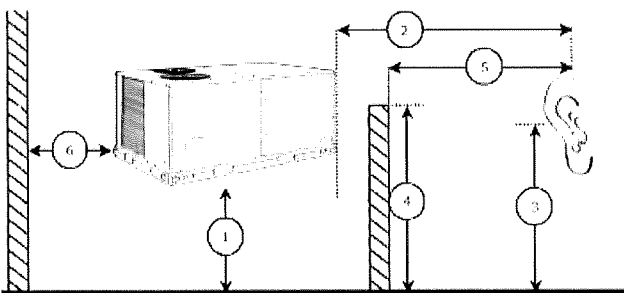
Control Panel SCCR: 5kA RMS at Rated Symmetrical Voltage

Acoustics

Sound Power Levels, db re 10E-12 Watts

	Discharge	Inlet	Outdoor
63 Hz	92.9	92.4	97.1
125 Hz	87.7	77.6	88.3
250 Hz	79.9	71.8	84.4
500 Hz	78.8	64.2	83.3
1000 Hz	73.6	59.0	80.7
2000 Hz	71.9	54.2	77.4
4000 Hz	71.8	48.0	73.4
8000 Hz	63.3	36.9	67.3
A-Weighted	81.2	70.1	86.0

Advanced Acoustics



Performance Summary For RTU-1

Project: Liberty Collective RTU-3 ALT
 Prepared By:

02/06/2024
 11:11AM

Advanced Acoustics Parameters

1. Unit height above ground:.....30.0 ft
2. Horizontal distance from unit to receiver:.....50.0 ft
3. Receiver height above ground:.....5.7 ft
4. Height of obstruction:.....0.0 ft
5. Horizontal distance from obstruction to receiver:.....0.0 ft
6. Horizontal distance from unit to obstruction:.....0.0 ft

Detailed Acoustics Information

Octave Band Center Freq. Hz	63	125	250	500	1k	2k	4k	8k	Overall
A	97.1	88.3	84.4	83.3	80.7	77.4	73.4	67.3	98.1 Lw
B	70.9	72.2	75.8	80.1	80.7	78.6	74.4	66.2	85.9 LwA
C	64.7	55.9	52.0	50.9	48.3	45.0	41.0	34.9	65.7 Lp
D	38.5	39.8	43.4	47.7	48.3	46.2	42.0	33.8	53.5 LpA

Legend

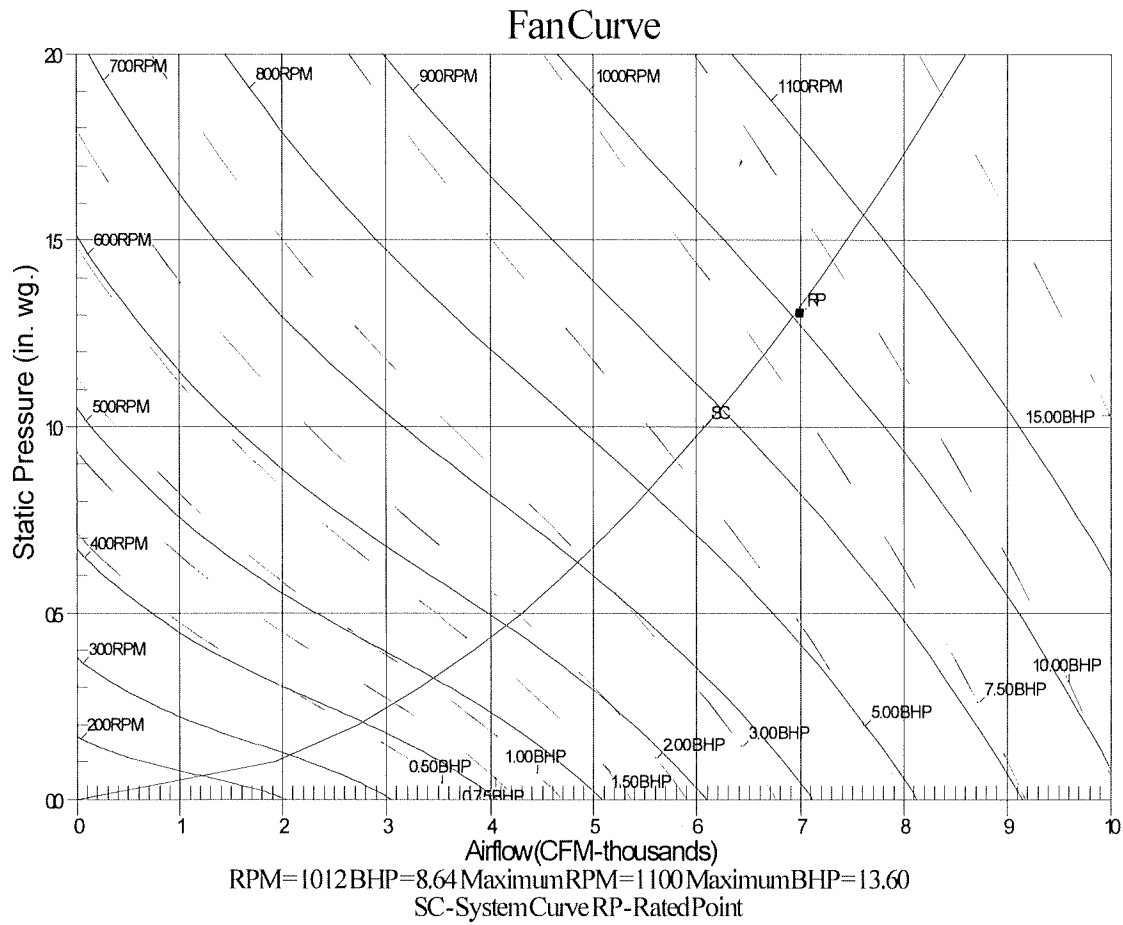
- A Sound Power Levels at Unit's Acoustic Center, Lw
- B A-Weighted Sound Power Levels at Unit's Acoustic Center, LwA
- C Sound Pressure Levels at Specific Distance from Unit, Lp
- D A-Weighted Sound Pressure Levels at Specific Distance from Unit, LpA

Calculation methods used in this program are patterned after the ASHRAE Guide; other ASHRAE Publications and the AHRI Acoustical Standards. While a very significant effort has been made to insure the technical accuracy of this program, it is assumed the user is knowledgeable in the art of system sound estimation and is aware of the tolerances involved in real world acoustical estimation. This program makes certain assumptions as to the dominant sound sources and sound paths which may not always be appropriate to the real system being estimated. Because of this, no assurances can be offered that this software will always generate an accurate sound prediction from user supplied input data. If in doubt about the estimation of expected sound levels in a space, an Acoustical Engineer or a person with sound prediction expertise should be consulted.

Performance Summary For RTU-1

Project: Liberty Collective RTU-3 ALT
Prepared By:

02/06/2024
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Unit Feature Sheet for RTU-1

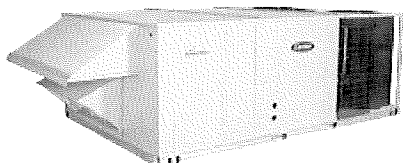
Project: Liberty Collective RTU-3 ALT
Prepared By:

02/06/2024
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 WeatherExpert® - 48LC

PACKAGED ROOFTOP GAS HEATING/ELECTRIC COOLING UNITS
12.5, 15, 17.5, 20 and 23 TONS



Optional Economizer PE Shown

WeatherExpert® - 48LC

48LC units are ultra high-efficiency, single-packaged electric cooling, gas heating units. Units utilize three stages of cooling capacity control with matching indoor fan motor speed control. All models are available with belt drive indoor fan motors with Variable Frequency Drive (VFD) speed controller and Direct Drive - ECM outdoor fan motor. Models offer standard electro mechanical controls that use Carrier's Comfort Control Logic and LED indicators.

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STANDARD FEATURES INCLUDE:

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- IEEER's up to 19.1 and EER's up to 12.5
- ASHRAE 90.1 compliant, Energy Star qualified
- Meets or exceeds CEE tier II performance criteria
- Three stage cooling capacity control with crankcase heaters
- Single refrigerant circuit with full face activated evaporator coil.
- Belt drive indoor fan and pulley system with Variable Frequency Drive (VFD) motor controller on all models
- High efficient ECM outdoor fan motor
- Sound levels as low as 84 dB.
- Precision sized TXV refrigerant metering devices
- Exclusive non-corrosive composite condensate pan in accordance with ASHRAE Standard 62, sloping design, side or center drain
- Standard ambient cooling operation down to 40°F (4°C) with lower operation range with integrated economizer. SystemVu™ controls allows operation down to 0°F (-18°C). Units operate to 125°F (52°C).
- Designed in accordance with UL, Standard 1995
- High performance 5/16" diameter, internally enhanced copper tube / aluminum fin condenser and evaporator coils
- Pre-painted exterior panels and primer-coated interior panels tested to 500 hours salt spray protection
- Exclusive IGC solid-state control for on-board diagnostics with LED error code designation burner control logic
- Induced draft gas heat combustion design
- Low pressure and high pressure switch protected.

MAINTENANCE FEATURES:

- Access panels with easy grip handles and tool-less filter access door
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- Two-inch disposable return air filters

INSTALLATION FEATURES:

- Thru-the-bottom power entry capability
- Single point gas and electric connections
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- 5-year compressor parts, 1-year parts, 3-year SystemVu™
- Many optional upgrades available

OPTIONS/ACCY INCLUDE BUT ARE NOT LIMITED TO:

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- Louvered condenser coil guards and coil coating options
- Ultra Low Leak Economizer and convenience outlet options
- Stainless Steel heat exchanger
- HACR breaker or non-fused disconnect switch
- Hinged access panels with quick turn latches and lift tabs
- Patented Humidi-Mizer[®] adaptive dehumidification system
- RTU Open multi-protocol DDC controller
- SystemVu Controls:
 - Large full text – multi line display
 - USB Flash Port for data transfer
 - Built in i-Vu[®], CCN and BACnet[®]
 - Refrigerant pressure from display
 - Quick LED Status – Run, Alarm, Fault
 - Conventional Stat or Sensor capabilities
 - Historical component runtime and starts
 - Supply Air Tempering
 - Equipment / System Touch Compatibility
 - Demand Limiting and ZS Sensor Compatibility

Spec Sheet for RTU-1

Project: Liberty Collective RTU-3 ALT
Prepared By:

02/06/2024
11:11AM