

18-170  
BID SPECS

**Phoenix**  
Design & Engineering, LLC.



**SUMMIT COUNTY CHILDREN'S  
SERVICES BOARD**

**TRAINING CENTER**

**HVAC UNIT REPLACEMENT PROJECT**

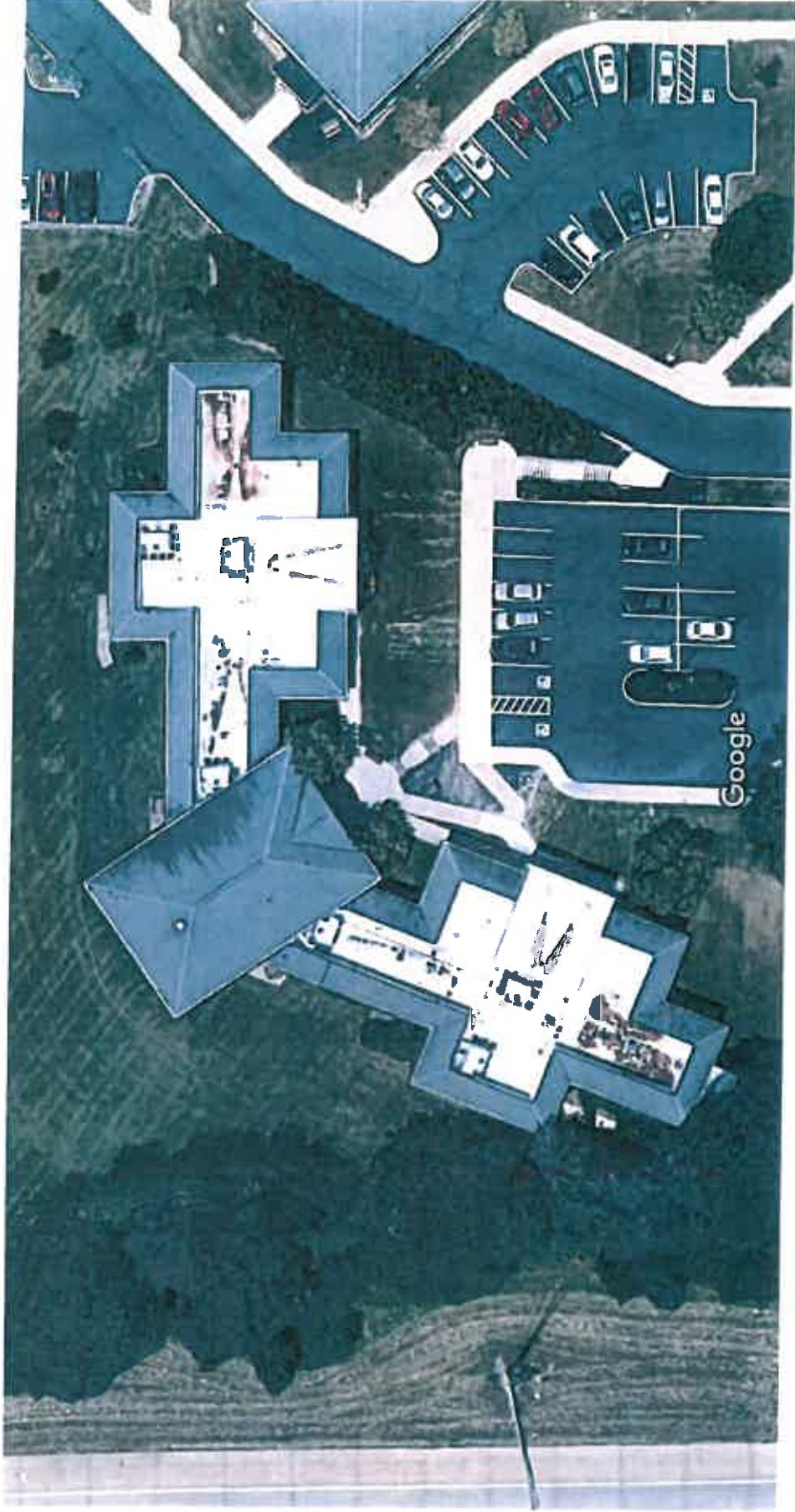
**264 SOUTH ARLINGTON ST.  
AKRON, OH 44306**



Imagery ©2018 Google, Map data ©2018 Google 100 ft

TRAINING CENTER

↑  
NORTH

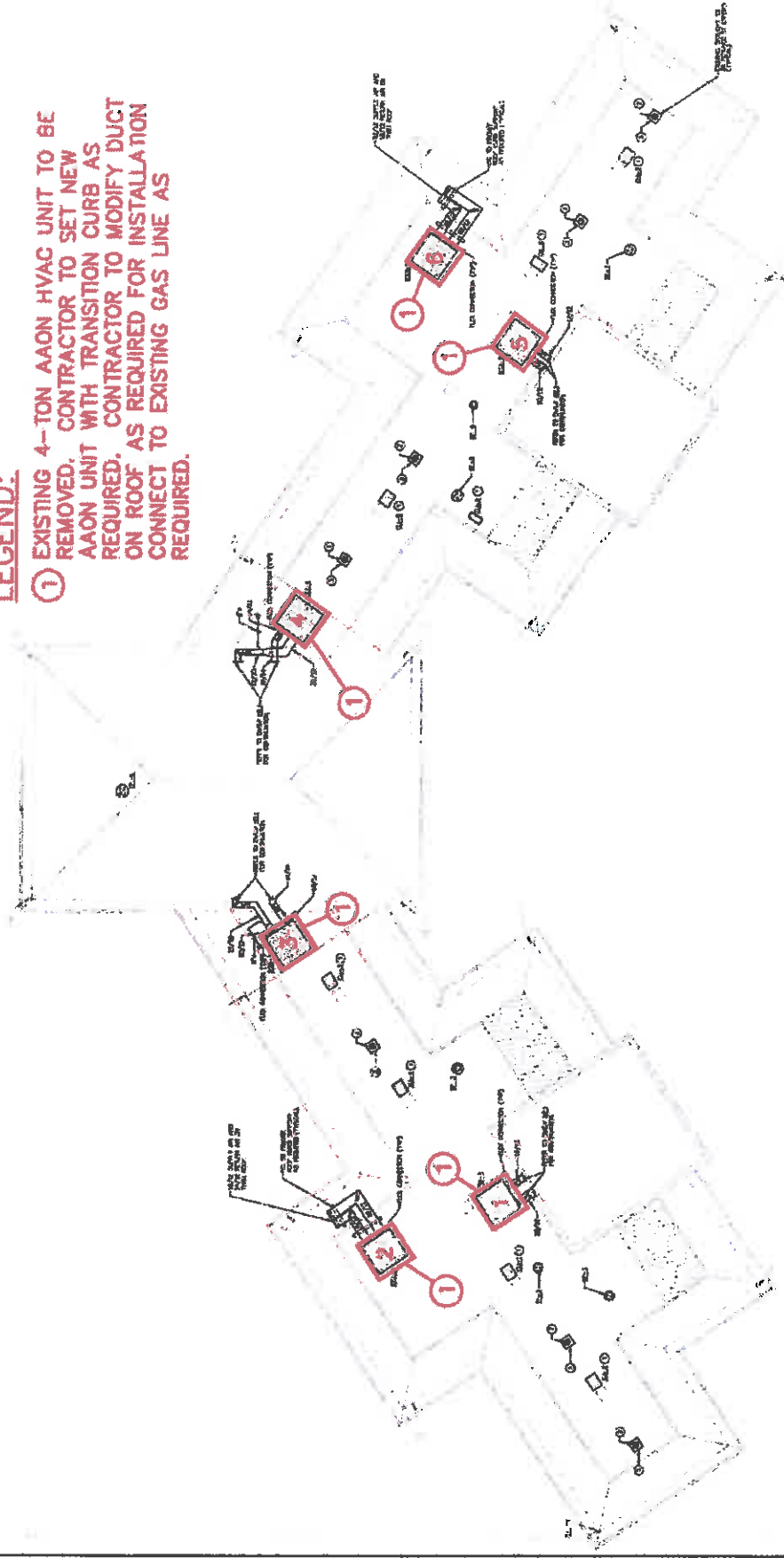


Imagery ©2018 Google, Map data ©2018 Google 20 ft

NORTH →

**LEGEND:**

- ① EXISTING 4-TON AAON HVAC UNIT TO BE REMOVED. CONTRACTOR TO SET NEW AAON UNIT WITH TRANSITION CURB AS REQUIRED. CONTRACTOR TO MODIFY DUCT ON ROOF AS REQUIRED FOR INSTALLATION CONNECT TO EXISTING GAS LINE AS REQUIRED.



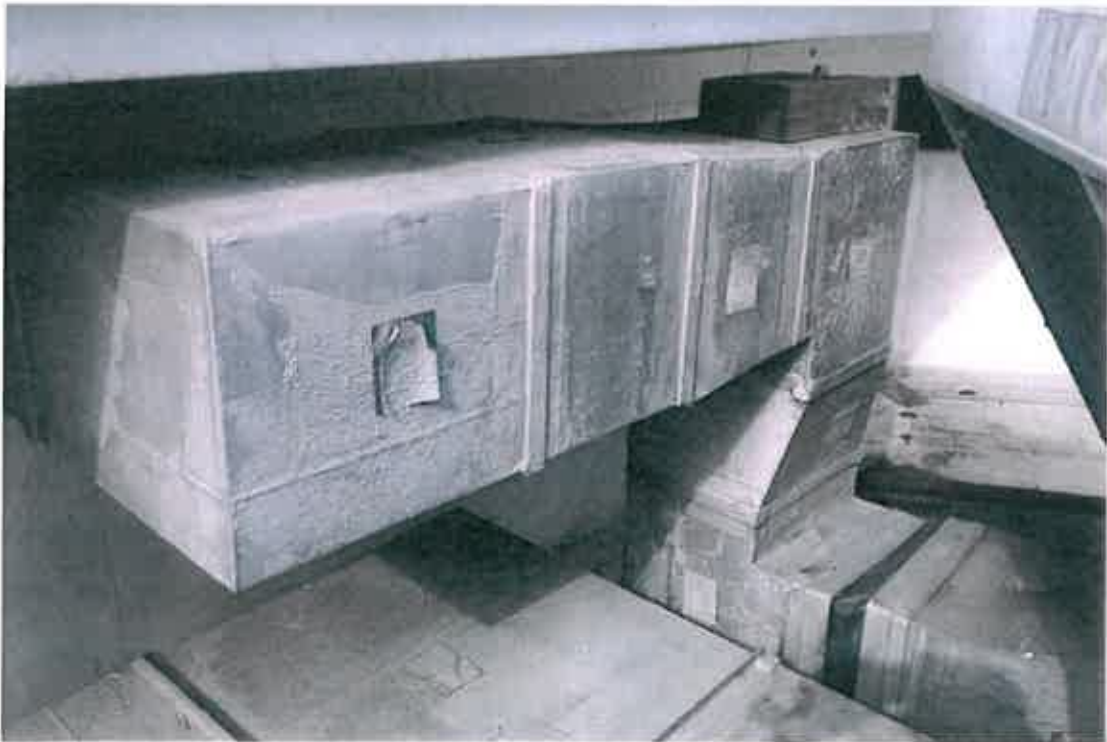
**HVAC ROOF PLAN**

SCALE: 1/8" = 1'-0"

- PLANNING:**
- ① - ALL NEW ROOFING SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE INTERNATIONAL BUILDING CODE (IBC).
  - ② - ALL NEW ROOFING SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE INTERNATIONAL BUILDING CODE (IBC).
  - ③ - ALL NEW ROOFING SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE INTERNATIONAL BUILDING CODE (IBC).
- GENERAL NOTES:**
- 1. ALL NEW ROOFING SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE INTERNATIONAL BUILDING CODE (IBC).













61 Milford Drive, Hudson, OH 44236  
Cleveland (330) 463-0100 Akron (330) 342-9400 Fax: (330) 463-0101  
<http://www.jacco.com>



## SUBMITTAL DATA

For Approval

For Record

### Tagging Information

RTU-1 thru RTU-6

Job Name - Summit County Children's Services Training Center

Owner - Summit County

Engineer - Phoenix  
Engineering

Date - 3/12/2018

Submitted By: Mike Mueller

***Focused On The Engineered Environment***



61 Milford Drive, Hudson, Ohio 44236  
Cleveland: (330) 463-0100 Akron: (330) 342-9400 Fax: (330) 463-0101  
<http://www.jacco.com>

Submitted To: Phoenix Engineering

Date: 3/12/2018

Project: Summit County Children's Services Training Center

Location: Summit County, OH

Quantity Of Six (6) AAON Model RN, Packaged Rooftop Air Handling Units, Complete With The Following:

**Cabinet**

- 2" R-13 Double Wall Foam Panel Construction
- No Through Metal Construction
- G-90 Galvanized Steel Construction
- ASTM Tested 2500 Hour Salt Spray Polyurethane Paint
- Stainless Steel Drain Pan

**Outside Air**

- Full Modulation Economizer, Mixed Air w/ Enthalpy Control
- Standard 2" Pleated, Throwaway Filters
- Clogged Filter Switch
- Magnehelic Gauge

**Heat Section**

- In-Direct Fired Natural Gas Heating w/ Stainless Steel Heat Exchanger & 4-Stages Of Gas Heat Control

**Refrigeration**

- Air Cooled Condenser Section
- ECM Condenser Fan
- Compressorized Refrigeration System R-410a w/ DX Cooling Coil
- Variable Capacity Scroll Compressor - 10-100% Cooling Modulation
- 5-Minute Anti-Short Cycle Protection And 20-Second Inter-Stage Time Delay Relays
- Fan Cycling For Low Ambient Control

**Fans**

- Direct Drive Supply Air Plenum Fan Assembly w/ ODP Premium Efficiency Motor
  - Factory Installed Variable Frequency Drive

**Electric & Controls**

- Single Point Power Connection w/ Non-Fused NEMA-1 Disconnect Switch & 24v Control Circuit
- Unit Wired For 208 / 3 / 60 Power
- Phase & Brown-Out Protection
- Factory Installed Dual 115v GFI Convenience Outlet
- Factory Installed Programmable Controller w/ Handheld Programming Tool

**Warranty & Service**

- Standard One (1) Year Limited Equipment Warranty - Parts Only
- Five (5) Year Limited Compressor Warranty, Parts Only
- Twenty-Five (25) Year Limited Heat Exchanger Warranty, Parts Only
- Check, Testing & Start-Up Service

**Curbs & Accessories**

- Adapter Curbs



# Unit Rating

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph (918) 683-2266 Fax (918) 583-0091  
AAONecat32 Ver. 4.267 (SN: 6198192-1)

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

**RQ-004-8-V-EA09-334 : A000-DOB-QJD-00C-CODAAABE-00-0000000VB**

Tag: RTU# 1

### Job Information

Job Name: Summit County Childrens Services Training  
Job Number: Center  
Site Altitude: Phoenix  
Refrigerant: 0 ft  
R-410A

### Unit Information

Approx. Op./Ship Weights: 941 / 941 lbs. (±5%)  
Supply CFM/ESP:  
Final Filter FV / Qty: 1310 / 0.55 in. wg.  
Outside CFM: 235.80 fpm / 2  
Ambient Temperature: 360  
Return Temperature: 88.6 °F DB / 72.6 °F WB  
75 °F DB / 62 °F WB

### Static Pressure

External: 0.55 in. wg.  
Evaporator: 0.19 in. wg.  
Filters Clean: 0.08 in. wg.  
Dirt Allowance: 0.35 in. wg.

Economizer: 0.06 in. wg.  
Heating: 0.10 in. wg.  
Cabinet: 0.04 in. wg.  
Total: 1.37 in. wg.

### Cooling Section

	Gross	Net
Total Capacity:	50.92	49.23 MBH
Sensible Capacity:	37.99	36.29 MBH
Latent Capacity:	12.93 MBH	
Mixed Air Temp:	79.00 °F DB	65.00 °F WB
Entering Air Temp:	79.00 °F DB	65.00 °F WB
Lv Air Temp (Coil):	51.65 °F DB	51.19 °F WB
Lv Air Temp (Unit):	52.83 °F DB	51.70 °F WB
Digital Comp. Capacity Ratio:	100%	
Supply Air Fan:	1 x RQ185-VFD @ 0.54 BHP	
SA Fan RPM / Width:	1242 / 3.000"	
Evaporator Coil:	5.3 ft <sup>2</sup> / 4 Rows / 14 FPI	
Evaporator Face Velocity:	249.5 fpm	

### Heating Section

PreHeat Type: Std (No Preheat)  
Heating Type: Nat. Gas Heat  
Heating CFM: 1310  
Total Capacity: 81.0 MBH  
OA Temp: 0.0 DB / -1.0 °F WB  
RA Temp: 70.0 °F DB / 53.0 °F WB  
Entering Air Temp: 50.0 °F DB / 38.5 °F WB  
Leaving Air Temp: 107.3 °F DB / 63.1 °F WB  
Input: 100.0 MBH  
Heater Qty (Hi/Low): 1  
Consumption: N/A  
Operation: N/A  
Total Turndown Ratio: 3.5:1

### Rating Information

Cooling Capacity (MBH): 50.0  
Cooling SEER: 15.7  
Cooling EER: 13.3  
Rated in accordance with AHRI 210/240

Application EER @ Op. Conditions: 13.4

### Electrical Data

Rating: 208/3/60  
Unit FLA: 26

Minimum Circuit Amp: 30  
Maximum Overcurrent: 45

	Qty	HP	VAC	Phase	RPM	FLA	RLA
Compressor 1:	1		208	3			16.1
Condenser Fans:	1	0.333	208	1	1110	2.8	
Supply Fan:	1	2.00	208	3	1780	7.5	
Combustion:	1	0.09	208	1	3000	1.3	

### Cabinet Sound Power Levels\*

Octave Bands:	63	125	250	500	1000	2000	4000	8000
Discharge LW(dB):	77	78	78	71	68	64	60	55
Return LW(dB):	73	74	68	59	58	55	50	42

\*Sound power levels are given for informational purposes only. The sound levels are not guaranteed.



# 18.5" STAR Plenum

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-3266 Fax (918) 583-6094  
AAONCat32 Ver 4 267 (SN: 6198192)

### JOB INFORMATION:

Job Name: *Summit County Childrens Services Training Center*  
 Job Tag: *RTU# 1*  
 Rep Firm: *500*  
 Date: *03/12/2018*  
*03/12/2018*

### WHEEL SPECIFICATION:

Max RPM: *2,200*  
 Diameter x Qty: *18.5 in. x 1*  
 CFM: *1310*  
 Tip Speed: *6,015 FPM*  
 Inertia: *6,015 FPM*

### OPERATING CONDITIONS:

Air Flow: *1,310 CFM*  
 Static Pressure: *1.37 in. Wg.*  
 Relief Dampers DP: *0.00 in. Wg.*  
 TSP: *1.37 in. Wg.*  
 Site Altitude: *0.00 Ft*  
 TSP @ Sea Level: *1.37 in. Wg.*

### MOTOR SELECTION:

Rated HP / Bypass: *2 / No*  
 Frame Size: *48*  
 Nominal RPM: *1760*  
 VAC/PH/Hz: *208/3/60*  
 Efficiency: *Standard / 0.815*  
 Enclosure Type: *ODP*  
 Max Inertial Load: *27 WR'*

### FAN PERFORMANCE:

RPM: *1242*  
 BHP: *0.54*  
 Efficiency: *52.1%*  
 In/Out Velocity: */ FPM*  
 Plenum Out Velocity: *22 FPM*

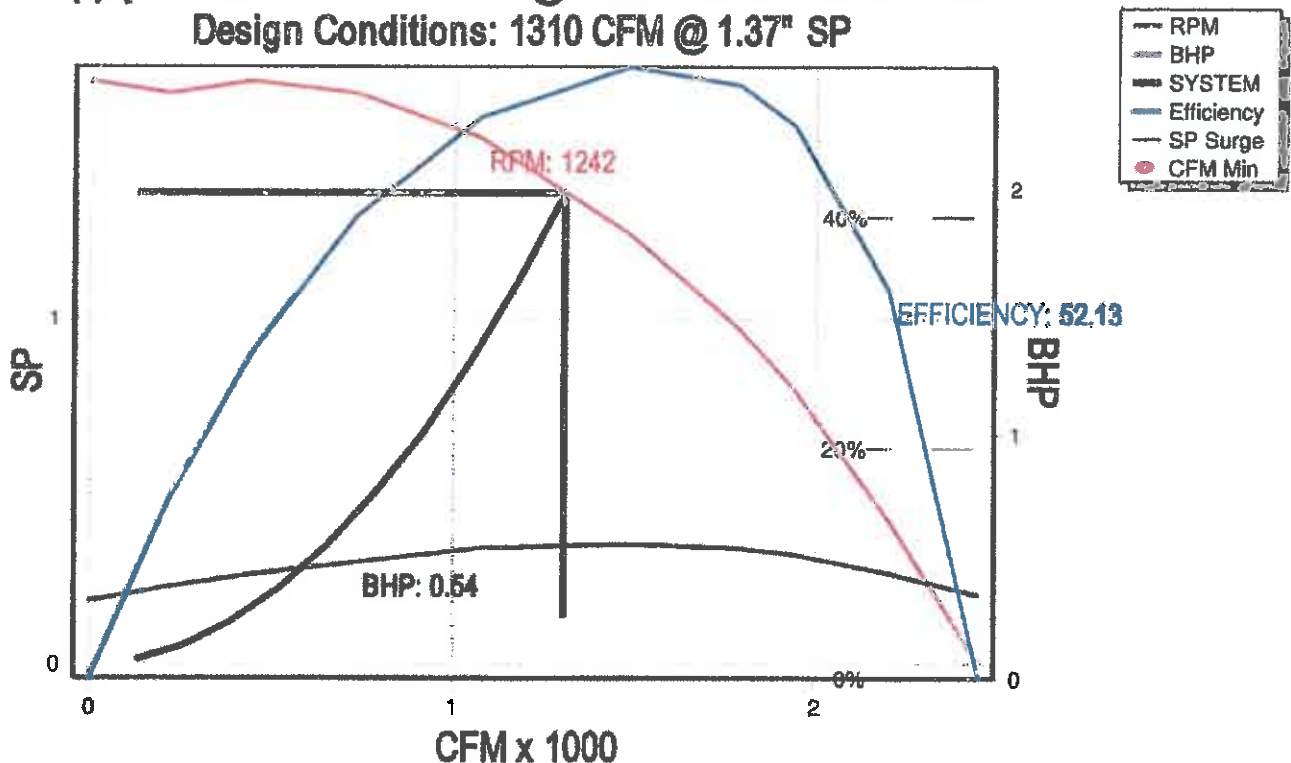
### FAN SOUND POWER (Inlet/Outlet):

Octave Band:	(Re 10 <sup>-12</sup> watts)							
	1	2	3	4	5	6	7	8
	77	78	78	73	69	67	64	59
	77	78	78	73	69	67	64	59

SOUND POWER A-Weighted: 78 / 78 dB

Max Duct SP with Blocked Airway: *1.7 in. Wg. @ 1242 rpm*

Supply Fan Model: RQ185-VFD @ 1242 RPM and 100% Width  
 Design Conditions: 1310 CFM @ 1.37" SP





# Unit Submittal

2425 South Yukon Ave. Tulsa, Oklahoma 74107-2728 · Ph. (918) 583-2266 Fax (918) 583-6094  
AAONEcat32 Ver. 4.267 (SN: 619A192-)

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

**RQ-004-8-V-EA09-334 : A000-DOB-QJD-00C-CODAAABE-00-0000000VB**

Tag: RTU# 1

Job Name: *Summit County Childrens Services Training Center*      Unit Submittal For:  
Job Number: *Phoenix*      Unit Submittal Date: *March 12, 2018*

	Base Option	Description
R	Series	Roof Top Unit
0	Generation	Tenth Generation
004	Unit Size	Four
3	Voltage	208V/3Ø/60Hz
V	Interior Protection	Vertical Discharge and Return
E	Refrigerant Style	R-410A Variable Capacity Scroll Compressor (VCC) - High Efficiency
A	Unit Configuration	Air-Cooled Cond. + Std Evap. Coil
0	Coil Coating	Standard
9	Cooling/Heat Pump Staging	Modulating - 1 Variable Capacity Compressor
3	Heating Type	Natural Gas Stainless Steel
3	Heating Designation	Heat 3 - 100 MBtu/h
4	Heating Staging	4 Stage

	Feature Option	Description
A	1A. RA/OA Section	Economizer
0	1B. RA/EA Blower Configuration	Standard - None
0	1C. RA/EA Blower	Standard - None
0	1D. RA/EA Blower Motor	Standard - None
0	2. OA Control	Fully Modulating Actuator - Enthalpy Limit
0	3. Heat Options	Standard
E	4. Maintenance Options	115V Convenience Outlet - Factory Wired
Q	5A. SA Blower Configuration	1 Blower + Inverter Rated 3 Phase Motor + VFD
J	5B. SA Blower	18" Direct Drive Backward Curved Plenum
D	5C. SA Motor	2 HP 1760 rpm
0	6A. Pre Filter Type	Standard - None
0	6B. Unit Filter Type	2" Pleated - MERV 8
C	6C. Filter Options	Clogged Filter Switch + Magnetic Gauge
C	7. Refrigeration Control	Adjustable Fan Cycling
0	8. Refrigeration Options	Standard
D	9. Refrigeration Accessories	ECM Condenser Fan - Multiple Speed
A	10. Power Options	Non-fused Disconnect Power Switch - 100 Amps
A	11. Safety Options	RA and SA Firestat
E	12. Controls	Phase & Brown Out Protection
E	13. Special Controls	Constant Volume (CV) Unit Controller - CV Cool + CV Heat
0	14A. Preheat Configuration	Standard - None
0	14B. Preheat Sizing	Standard - None
0	15. Glycol Percent	Water or No WSHP
0	16. Interior Cabinet Options	Standard - Double Wall + R-13 Foam Insulation + Stainless Steel Drain Pan
0	17. Exterior Cabinet Options	Standard
0	18. Customer Code	Standard
0	19. Code Options	Standard - ETL U.S.A. Listing
0	20. Crating	Standard
0	21. Water-Cooled Cond.	Standard - None
V	22. Control Vendors	VCCX w/ BACnet MSTP
B	23. Type	Standard - Includes AAON Gray Paint



# VCCX Components

2425 South Yulien Ave · Tulsa, Oklahoma 74107-2728 · Ph (918) 583-2266 Fax (918) 583-6094  
AAONEest32 Ver 4.267 (SN: 6198192-1)

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

**RQ-004-8-V-EA09-334 : A000-DOB-QJD-00C-C0DAABE-00-0000000VB**

Tag: RTU# 1

Job Name:

*Summit County Childrens  
Services Training Center*

VCCX For:

Job Number:

*Phoenix*

VCCX Date:

*March 12, 2018*

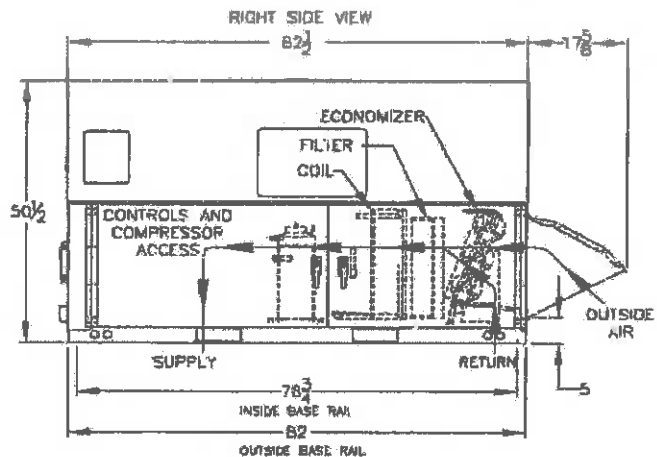
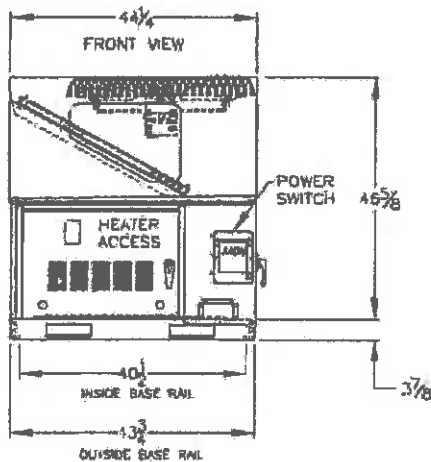
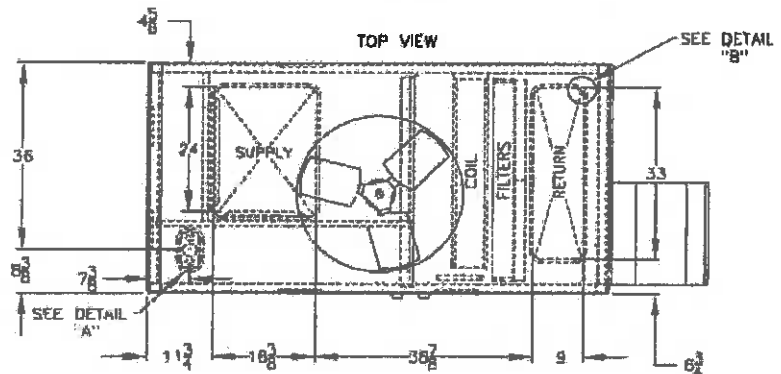
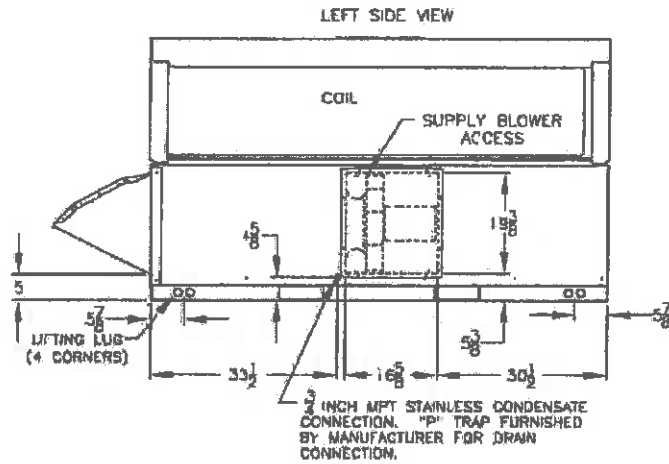
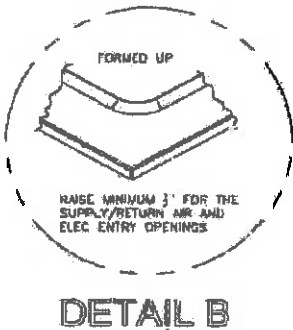
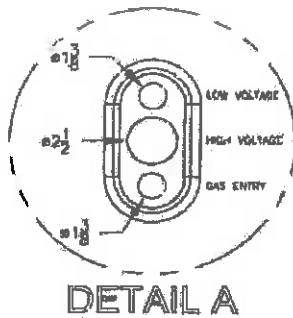
## Hardware Included For VCCX Controller

Part #	Included Parts	Assigned Channel	BACnet Point
V87900	VCCX CONTROLLER		
P94320	Space Temp Sensor	VCCX control point AI 1	AI:2
V13050	OSA Temp/Hum Sensor	EBUS2 communicating sensor	AI:16 AI:17 AI:18 AI:19
P94320	Space Temp Slide Adjust	VCCX control point AI 2	AI:8
R82890	Supply Temp Sensor - Field Installed	VCCX control point AI 3	AI:9
	Supply Fan Control Signal 0-10VDC	VCCX control point AO 1	AO:22
	Economizer	VCCX control point AO 2	AO:30
R62890	Proof of Air Flow	VCCX control point BI 1	BI:6
R64580	Duty Filter Sensor	VCCX control point BI 2	BI:25
	Safety Shut Down	VCCX control point BI 8	BI:26
	Supply Fan	Configured Relay point	BI:63
	Heat 1	Configured Relay Point	BI:64
	Heat 2	Configured Relay Point	BI:65
	Heat 3	Configured Relay Point	BI:66
	Heat 4	Configured Relay Point	BI:67
V61520	DIGITAL REFRIGERATION MODULE		
R57500	Comp Discharge Temp A	RSMD point TEMP 1	AI:56
V38891	Suction Pressure Sensor A	RSMD point AI1	AI:48
	Comp Status Input A	RSMD point BIN1	
	Emergency Shutdown	RSMD point BIN4	BI:81,82
	Condenser Enable AB	RSMD Fixed Relay point	BI:78, BI:85
	Comp Enable A	RSMD Fixed Relay point	AI:46

# RQ CABINET ECONOMIZER VERTICAL ~ 1-6 TON

CLEARANCES	
LOCATION	• UNIT SIZE •
	1-6 TON
OUTSIDE AIR (BACK)	36"
HXC (FRONT)	36"
LEFT SIDE	24"
RIGHT SIDE	48"
TOP	UNOBSTRUCTED

**\*CLEARANCE IS MEASURED FROM THE END OF THE OUTSIDE AIR RAIN HOOD**



RQ-00007 REV:E 04/12/16 AAS  
NOTE: ALL DIMENSIONS ARE IN INCHES



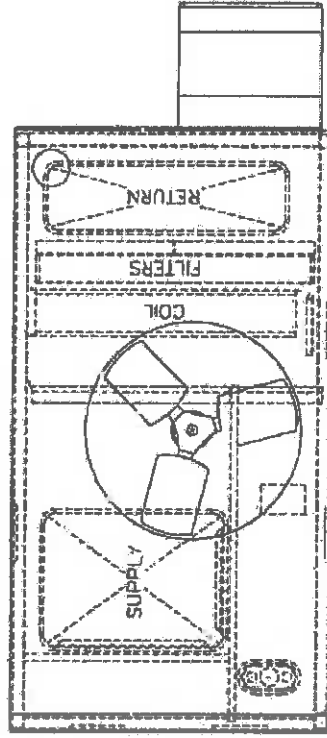
# RQ CABINET VERTICAL AIR COOLED CONDENSING UNIT

RQ-004-8-V-EA09-334-A000-D0E-QJD-00C-CODAABE-00-00000000VB

Back Left Corner:  
211 lbs

Front Left  
Corner:  
228 lbs

44"



Front Right  
Corner:  
261 lbs

+X

0"

CGx: 39.3"

CGy: 20.5"

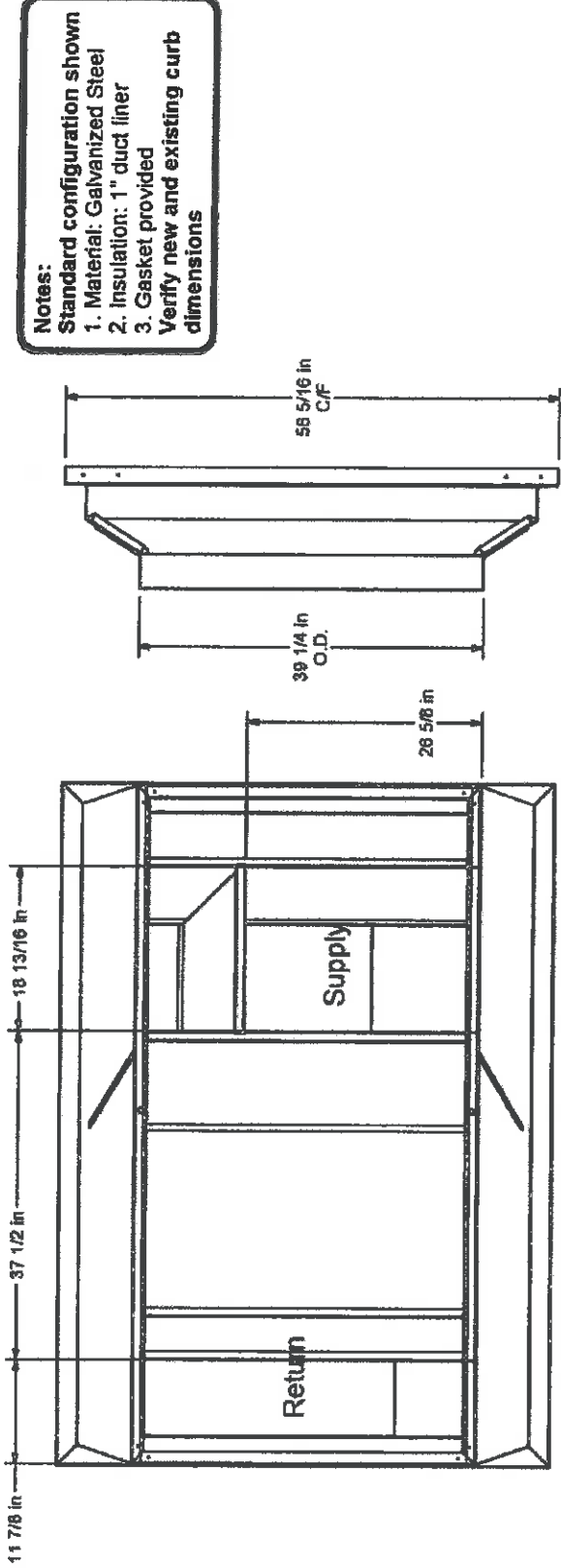
Back Right  
Corner:  
240 lbs

82"

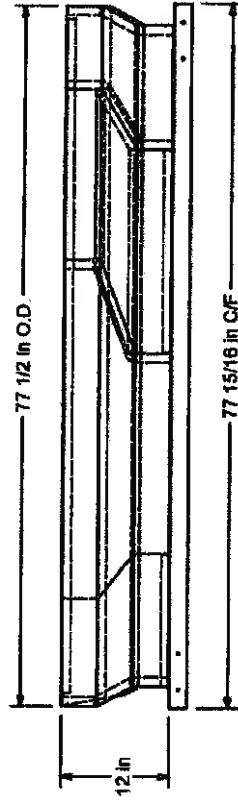
Total Weight:  
941 lbs (±5%)

Disclaimer:  
This weight estimate does not account for any SPAs.





Plan



**Notes:**

- Standard configuration shown**
1. Material: Galvanized Steel
  2. Insulation: 1" duct liner
  3. Gasket provided
- Verify new and existing curb dimensions**

The information contained in this drawing is the sole property of Thybar Corporation. Any reproduction in part or whole without the written consent of Thybar Corporation is prohibited.

**(DO NOT SCALE DRAWING)**  
 Unless otherwise specified dimensions are in inches  
 tolerances are  
 ± 1/16 ± 0.0025 ± 1"

Date: 3/7/2017

Retromate Standard  
 New Aeon RQ 002-006 Standard  
 Existing Aeon A CAB. R\_02-07

Retromate Weight  
 lbs.  
 Total Weight  
 125 lbs.

QTY.:	Job #:
Tag:	
Drawn:	
Checked:	
File:	AN03753AN00074
Rev:	B





# Unit Rating

2428 South Yukon Ave Tulsa, Oklahoma 74117-2728 • Ph: (918) 583-2266 Fax: (918) 583-6091  
AAONCat32 Ver. 4.267 (SN: 6198193-1)

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 21.1 21.2

**RQ-004-8-V-EA09-354:A000-D0B-QJD-00C-C0DAABE-00-0000000VB**  
Tag: RTU# 2

### Job Information

Job Name: *Summit County Childrens Services Training Center*  
Job Number:  
Site Altitude: *Phoenix*  
Refrigerant: *0 ft*  
*R-410A*

### Unit Information:

Approx. Op./Ship Weights: *955 / 955 lbs. (±5%)*  
Supply CFM/ESP:  
Final Filter FV / Qty: *1715 / 0.55 in. wg.*  
Outside CFM: *308.70 fpm / 2*  
Ambient Temperature: *600*  
Return Temperature: *88.6 °F DB / 72.6 °F WB*  
*75 °F DB / 62 °F WB*

### Static Pressure

External: *0.55 in. wg.*  
Evaporator: *0.27 in. wg.*  
Filters Clean: *0.12 in. wg.*  
Dirt Allowance: *0.35 in. wg.*

Economizer: *0.11 in. wg.*  
Heating: *0.09 in. wg.*  
Cabinet: *0.06 in. wg.*  
Total: *1.55 in. wg.*

### Cooling Section

	<b>Gross</b>	<b>Net</b>
Total Capacity:	<i>53.31</i>	<i>50.85 MBH</i>
Sensible Capacity:	<i>43.83</i>	<i>41.37 MBH</i>
Latent Capacity:	<i>9.48 MBH</i>	
Mixed Air Temp:	<i>79.00 °F DB</i>	<i>65.00 °F WB</i>
Entering Air Temp:	<i>79.00 °F DB</i>	<i>65.00 °F WB</i>
Lv Air Temp (Coil):	<i>54.92 °F DB</i>	<i>54.31 °F WB</i>
Lv Air Temp (Unit):	<i>56.23 °F DB</i>	<i>54.85 °F WB</i>
Digital Comp. Capacity Ratio:	<i>100%</i>	
Supply Air Fan:	<i>1 x RO185-VFD @ 0.79 BHP</i>	
SA Fan RPM / Width:	<i>1401 / 3.000"</i>	
Evaporator Coil:	<i>5.3 ft<sup>2</sup> / 4 Rows / 14 FPI</i>	
Evaporator Face Velocity:	<i>326.7 fpm</i>	

### Heating Section

PreHeat Type: *Std (No Preheat)*  
Heating Type: *Nat. Gas Heat*  
Heating CFM: *1715*  
Total Capacity: *113.4 MBH*  
OA Temp: *0.0 DB / -1.0 °F WB*  
RA Temp: *70.0 °F DB / 53.0 °F WB*  
Entering Air Temp: *48.0 °F DB / 38.5 °F WB*  
Leaving Air Temp: *109.3 °F DB / 64.4 °F WB*  
Input: *140.0 MBH*  
Heater Qty (Hi/Low): *1*  
Consumption: *140.0 MBH*  
Operation: *N/A*  
Total Turndown Ratio: *5:1*

### Rating Information

Cooling Capacity (MBH): *50.0*  
Cooling SEER: *15.7*  
Cooling EER: *13.3*  
*Rated in accordance with AHRI 210/240*

Application EER @ Op. Conditions: *13.1*

### Electrical Data

Rating:	<i>208/3/60</i>	Minimum Circuit Amp:	<i>30</i>				
Unit FLA:	<i>26</i>	Maximum Overcurrent:	<i>45</i>				
	<b>Qty</b>	<b>HP</b>	<b>VAC</b>	<b>Phase</b>	<b>RPM</b>	<b>FLA</b>	<b>RLA</b>
Compressor 1:	<i>1</i>		<i>208</i>	<i>3</i>			<i>16.1</i>
Condenser Fans:	<i>1</i>	<i>0.333</i>	<i>208</i>	<i>1</i>	<i>1110</i>	<i>2.8</i>	
Supply Fan:	<i>1</i>	<i>2.00</i>	<i>208</i>	<i>3</i>	<i>1760</i>	<i>7.5</i>	
Combustion:	<i>1</i>	<i>0.08</i>	<i>208</i>	<i>1</i>	<i>3000</i>	<i>1.3</i>	

### Cabinet Sound Power Levels\*

Octave Bands:	<b>63</b>	<b>125</b>	<b>250</b>	<b>500</b>	<b>1000</b>	<b>2000</b>	<b>4000</b>	<b>8000</b>
Discharge LW(dB):	<i>80</i>	<i>80</i>	<i>81</i>	<i>75</i>	<i>69</i>	<i>67</i>	<i>63</i>	<i>58</i>
Return LW(dB):	<i>76</i>	<i>76</i>	<i>71</i>	<i>63</i>	<i>61</i>	<i>58</i>	<i>53</i>	<i>45</i>

\*Sound power levels are given for informational purposes only. The sound levels are not guaranteed.



# 18.5" STAR Plenum

2425 South Yukon Ave Tulsa, Oklahoma 74107-2728 • Ph. (918) 563-2266 Fax (918) 583-6094  
AAONEcat33 Ver. 4.267 (SN: 6198192)

### JOB INFORMATION:

Job Name: Summit County Childrens  
 Job Tag: Services Training Center  
 Rep Firm: RTU# 2  
 Date: 500  
 03/12/2018  
 03/12/2018

### WHEEL SPECIFICATION:

Max RPM: 2,200  
 Diameter x Qty: 18.5 in. x 1  
 CFM: 1715  
 Tip Speed: 6,785 FPM  
 Inertia: 6,785 FPM

### OPERATING CONDITIONS:

Air Flow: 1,715 CFM  
 Static Pressure: 1.55 in. Wg.  
 Relief Dampers DP: 0.00 in. Wg.  
 TSP: 1.55 in. Wg.  
 Site Altitude: 0.00 Ft  
 TSP @ Sea Level: 1.55 in. Wg.

### MOTOR SELECTION:

Rated HP / Bypass: 2 / No  
 Frame Size: 48  
 Nominal RPM: 1760  
 VAC/PH/Hz: 208/3/60  
 Efficiency: Standard / 0.815  
 Enclosure Type: ODP  
 Max Inertial Load: 27 WR<sup>2</sup>

### FAN PERFORMANCE:

RPM: 1401  
 BHP: 0.79  
 Efficiency: 53.2%  
 In/Out Velocity: /FPM  
 Plenum Out Velocity: 39 FPM

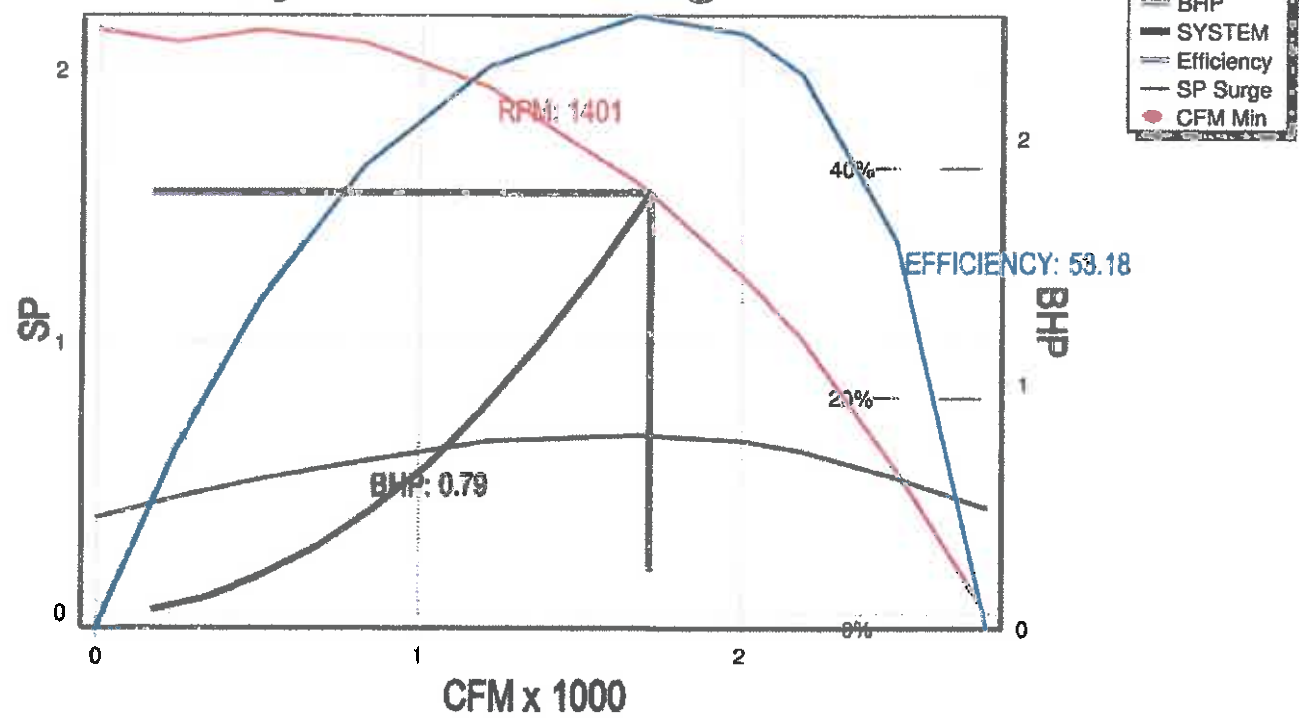
### FAN SOUND POWER (Inlet/Outlet):

Octave Band:		(Re 10 <sup>-12</sup> watts)							
1	2	3	4	5	6	7	8		
80	80	81	77	72	70	67	62		
80	80	81	77	72	70	67	62		

SOUND POWER A-Weighted: 81 / 81 dB

Max Duct SP with Blocked Airway: 2.2 in. Wg. @ 1401 rpm

Supply Fan Model: RQ185-VFD @ 1401 RPM and 100% Width  
 Design Conditions: 1715 CFM @ 1.55" SP





# Unit Submittal

2125 South Yukon Ave. Tulsa, Oklahoma 74107-2728 • Ph. (918) 583-2266 Fax (918) 583-6094  
AAONcat02 Ver 4.267 (SN: 6198192)

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

**RQ-004-8-V-EA09-354 : A000-DOB-QJD-00C-CODAABE-00-000000VB**  
Tag: RTU# 2

**Job Name:** Summit County Childrens Services Training Center  
**Job Number:** Phoenix  
**Unit Submittal For:**  
**Unit Submittal Date:** March 12, 2018

	Base Option	Description
<b>R</b>	Series	Roof Top Unit
<b>Q</b>	Generation	Tenth Generation
<b>004</b>	Unit Size	Four
<b>8</b>	Voltage	208V/3Ø/60Hz
<b>V</b>	Interior Protection	Vertical Discharge and Return
<b>E</b>	Refrigerant Style	R-410A Variable Capacity Scroll Compressor (VCC) - High Efficiency
<b>A</b>	Unit Configuration	Air-Cooled Cond. + Std Evap. Coil
<b>0</b>	Coil Coating	Standard
<b>9</b>	Cooling/Heat Pump Staging	Modulating - 1 Variable Capacity Compressor
<b>3</b>	Heating Type	Natural Gas Stainless Steel
<b>5</b>	Heating Designation	Heat 5 - 140 MBtuh
<b>4</b>	Heating Staging	4 Stage

	Feature Option	Description
<b>A</b>	1A. RA/OA Section	Economizer
<b>0</b>	1B. RA/EA Blower Configuration	Standard - None
<b>0</b>	1C. RA/EA Blower	Standard - None
<b>0</b>	1D. RA/EA Blower Motor	Standard - None
<b>0</b>	2. OA Control	Fully Modulating Actuator - Enthalpy Limit
<b>0</b>	3. Heat Options	Standard
<b>B</b>	4. Maintenance Options	115V Convenience Outlet - Factory Wired
<b>Q</b>	5A. SA Blower Configuration	1 Blower + Inverter Rated 3 Phase Motor + VFD
<b>J</b>	5B. SA Blower	19" Direct Drive Backward Curved Plenum
<b>D</b>	5C. SA Motor	2 HP 1760 rpm
<b>0</b>	6A. Pre Filter Type	Standard - None
<b>0</b>	6B. Unit Filter Type	2" Pleated - MERV 8
<b>C</b>	6C. Filter Options	Clogged Filter Switch + Magnehelic Gauge
<b>C</b>	7. Refrigeration Control	Adjustable Fan Cycling
<b>0</b>	8. Refrigeration Options	Standard
<b>D</b>	9. Refrigeration Accessories	ECM Condenser Fan - Multiple Speed
<b>A</b>	10. Power Options	Non-fused Disconnect Power Switch - 100 Amps
<b>A</b>	11. Safety Options	RA and SA Firestat
<b>B</b>	12. Controls	Phase & Brown Out Protection
<b>E</b>	13. Special Controls	Constant Volume (CV) Unit Controller - CV Cool + CV Heat
<b>0</b>	14A. Preheat Configuration	Standard - None
<b>0</b>	14B. Preheat Sizing	Standard - None
<b>0</b>	15. Glycol Percent	Water or No WSHP
<b>0</b>	16. Interior Cabinet Options	Standard - Double Wall + R-13 Foam Insulation + Stainless Steel Drain Pan
<b>0</b>	17. Exterior Cabinet Options	Standard
<b>0</b>	18. Customer Code	Standard
<b>0</b>	19. Code Options	Standard - ETL U.S.A. Listing
<b>0</b>	20. Crating	Standard
<b>0</b>	21. Water-Cooled Cond.	Standard - None
<b>V</b>	22. Control Vendors	VCCX w/ BACnet MSTP
<b>B</b>	23. Type	Standard - Includes AAON Gray Paint



# VCCX Components

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6084  
AAONEca02 Ver. 4.267 (SN: 6198102)

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

RQ-004-8-V-EA09-354 : A000-D0B-QJD-00C-C0DAABE-00-0000000VB

Tag: RTU# 2

Job Name:

Summit County Childrens  
Services Training Center  
Phoenix

VCCX For:

Job Number:

VCCX Date:

March 12, 2018

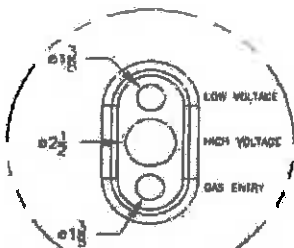
### Hardware Included For VCCX Controller

Part#	Included Parts	Assigned Channel	BACnet Point
V87900	VCCX CONTROLLER		
P94320	Space Temp Sensor	VCCX control point AI 1	AI12
V19050	OSA Temp/Hum Sensor	EBUS2 communicating sensor	AI16, AI17, AI18, AI19
P94320	Space Temp Slide Adjust	VCCX control point AI 2	AI8
R82890	Supply Temp Sensor - Field Installed	VCCX control point AI 3	AI9
	Supply Fan Control Signal 0-10VDC	VCCX control point AO 1	AO22
	Economizer	VCCX control point AO 2	AO30
R62330	Proof of Air Flow	VCCX control point BI 1	BI6
R64590	Dirty Filter Sensor	VCCX control point BI 2	BI25
	Safety Shut Down	VCCX control point BI 8	BI26
	Supply Fan	Configured Relay point	BI63
	Heat 1	Configured Relay Point	BI64
	Heat 2	Configured Relay Point	BI65
	Heat 3	Configured Relay Point	BI66
	Heat 4	Configured Relay Point	BI67
V61520	DIGITAL REFRIGERATION MODULE		
R57800	Comp Discharge Temp A	RSMD point TEMP1	AI56
V88391	Suction Pressure Sensor A	RSMD point AI1	AI48
	Comp Status Input A	RSMD point BIN1	
	Emergency Shutdown	RSMD point BIN4	BI81, 82
	Condenser Enable AB	RSMD Fixed Relay point	BI78, BI85
	Comp Enable A	RSMD Fixed Relay point	AI46

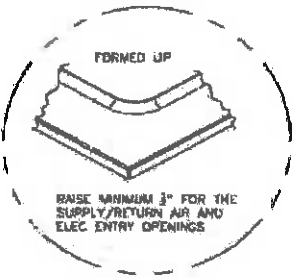
# RQ CABINET ECONOMIZER VERTICAL ~ 1-6 TON

CLEARANCES	
LOCATION	• UNIT SIZE •
	1-8 TON
OUTSIDE AIR (BACK)	36*
HXC (FRONT)	36
LEFT SIDE	24
RIGHT SIDE	48
TOP	UNOBSTRUCTED

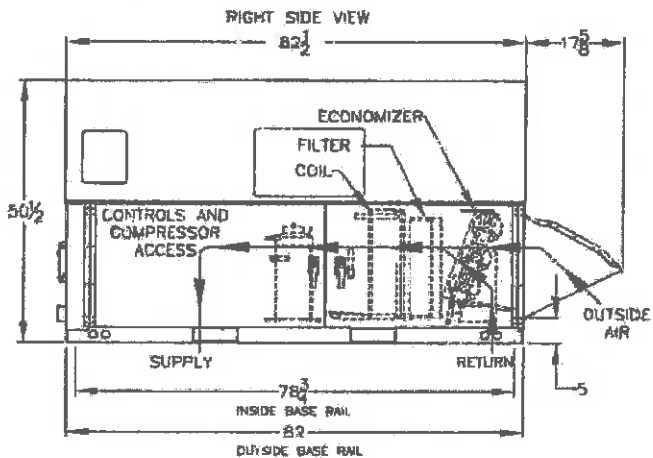
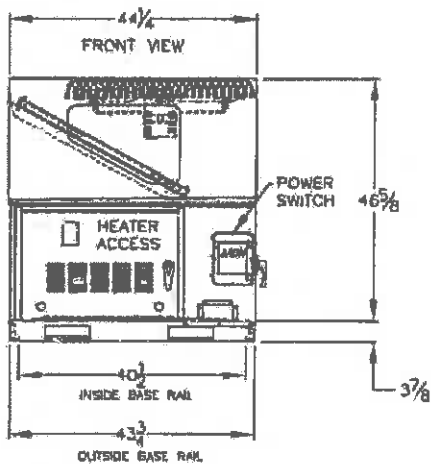
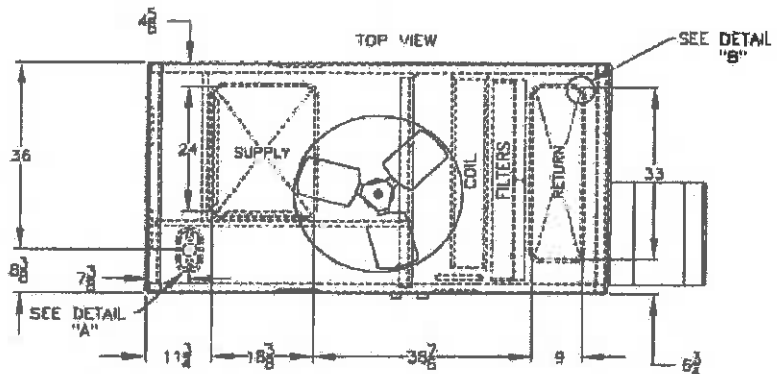
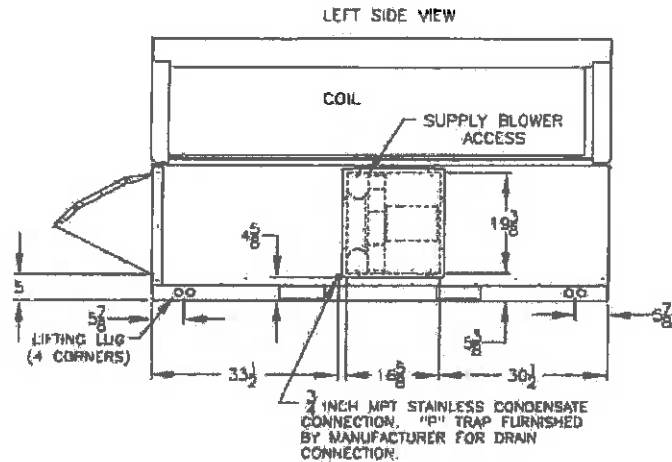
\*CLEARANCE IS MEASURED FROM THE END OF THE OUTSIDE AIR RAIN HOOD



DETAIL A



DETAIL B

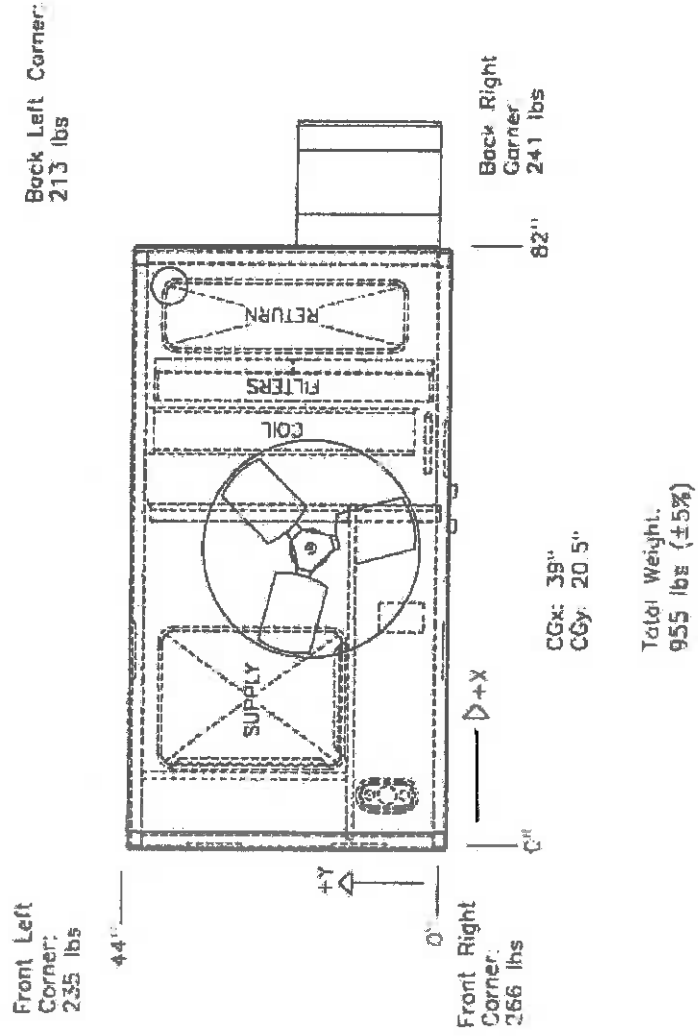


RQ-0007 REV:E 04/12/18 AAS  
NOTE: ALL DIMENSIONS ARE IN INCHES

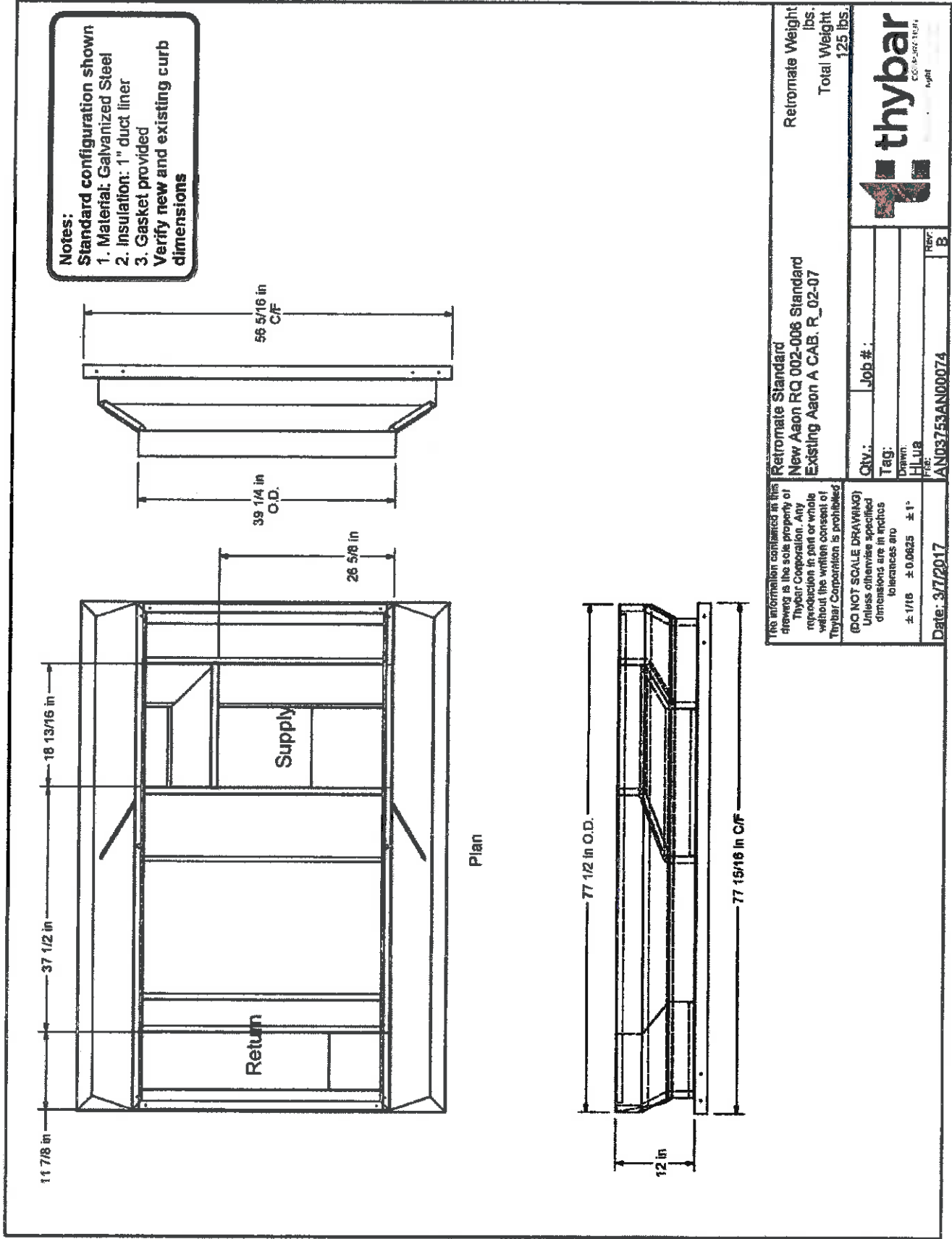
# RQ CABINET VERTICAL AIR COOLED CONDENSING UNIT



RQ-004-8-V-EA09-354-A000-DOB-QJD-00C-C0DAABE-00-00000000VB



**Disclaimer:**  
This weight estimate does not account for any SPAs.







# Unit Rating

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph: (918) 563-2266 Fax: (918) 563-6094  
 AAOE-0032 Ver. 1.267 (SN: 6196192)

LA LB LC LD LE LF LG LH LI LK LL LM LN LO LP LQ LR LS LT LU LV LW LX LY LZ  
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

**RQ-004-8-V-EA09-334:A000-DOB-QJD-00C-CODAABE-00-0000000VB**

Tag: RTU# 3 & 4

### Job Information

Job Name: Summit County Childrens Services Training  
 Job Number: Center  
 Site Altitude: Phoenix  
 Refrigerant: 0 ft  
 R-410A

### Unit Information

Approx. Op./Ship Weights: 941 / 941 lbs. (±5%)  
 Supply CFM/ESP:  
 Final Filter FV / Qty: 1415 / 0.55 in. wg.  
 Outside CFM: 254.70 fpm / 2  
 Ambient Temperature: 450  
 Return Temperature: 88.6 °F DB / 72.6 °F WB  
 75 °F DB / 62 °F WB

### Static Pressure

External: 0.55 in. wg.  
 Evaporator: 0.21 in. wg.  
 Filters Clean: 0.09 in. wg.  
 Dirt Allowance: 0.35 in. wg.

Economizer: 0.07 in. wg.  
 Heating: 0.11 in. wg.  
 Cabinet: 0.04 in. wg.  
 Total: 1.43 in. wg.

### Cooling Section

	Gross	Net
Total Capacity:	51.41	49.51 MBH
Sensible Capacity:	39.52	37.62 MBH
Latent Capacity:	11.89 MBH	
Mixed Air Temp:	79.00 °F DB	65.00 °F WB
Entering Air Temp:	79.00 °F DB	65.00 °F WB
Lv Air Temp (Coil):	52.67 °F DB	52.28 °F WB
Lv Air Temp (Unit):	53.89 °F DB	52.80 °F WB
Digital Comp. Capacity Ratio:	100%	
Supply Air Fan:	1 x RQ185-VFD @ 0.61 BHP	
SA Fan RPM / Width:	1287 / 3.000"	
Evaporator Coil:	5.3 R <sup>2</sup> / 4 Rows / 14 FPI	
Evaporator Face Velocity:	269.5 fpm	

### Heating Section

PreHeat Type: Std (No Preheat)  
 Heating Type: Nat. Gas Heat  
 Heating CFM: 1415  
 Total Capacity: 81.0 MBH  
 OA Temp: 0.0 DB / -1.0°F WB  
 RA Temp: 70.0 °F DB / 53.0 °F WB  
 Entering Air Temp: 51.0 °F DB / 38.5 °F WB  
 Leaving Air Temp: 104.1 °F DB / 61.6 °F WB  
 Input: 100.0 MBH  
 Heater Qty (Hi/Low): 1  
 Consumption: 100.0 MBH  
 Operation: N/A  
 Total Turndown Ratio: 3.5:1

### Rating Information

Cooling Capacity (MBH): 50.0  
 Cooling SEER: 15.7  
 Cooling EER: 13.3  
 Rated in accordance with AHRI 210/240

Application EER @ Op. Conditions: 13.3

### Electrical Data

Rating:	208/3/60			Minimum Circuit Amp:	30		
Unit FLA:	26			Maximum Overcurrent:	45		
	Qty	HP	VAC	Phase	RPM	FLA	RLA
Compressor 1:	1		208	3			16.1
Condenser Fans:	1	0.333	208	1	1110	2.8	
Supply Fan:	1	2.00	208	3	1760	7.5	
Combustion:	1	0.09	208	1	3000	1.3	

### Cabinet Sound Power Levels\*

Octave Bands:	63	125	250	500	1000	2000	4000	8000
Discharge LW(dB):	78	79	78	73	67	65	61	56
Return LW(dB):	73	74	69	60	59	57	50	43

\*Sound power levels are given for informational purposes only. The sound levels are not guaranteed.



# 18.5" STAR Plenum

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2738 - Ph. (918) 588-2266 Fax (918) 583-6084  
AAONEcat32 Ver. 4.267 (SN: 6198192-)

### JOB INFORMATION:

Job Name: *Summit County Childrens Services Training Center*  
 Job Tag: *RTU# 3 & J*  
 Rep Firm: *500*  
 Date: *03/12/2018*  
*03/12/2018*

### WHEEL SPECIFICATION:

Max RPM: *2,200*  
 Diameter x Qty: *18.5 in. x 1*  
 CFM: *1415*  
 Tip Speed: *6,333 FPM*  
 Inertia: *6,333 FPM*

### OPERATING CONDITIONS:

Air Flow: *1,415 CFM*  
 Static Pressure: *1.43 in. Wg.*  
 Relief Dampers DP: *0.00 in. Wg.*  
 TSP: *1.43 in. Wg.*  
 Site Altitude: *0.00 Ft*  
 TSP @ Sea Level: *1.43 in. Wg.*

### MOTOR SELECTION:

Rated HP / Bypass: *2 / No*  
 Frame Size: *48*  
 Nominal RPM: *1760*  
 VAC/PHVHZ: *208/60*  
 Efficiency: *Standard / 0.815*  
 Enclosure Type: *ODP*  
 Max Inertial Load: *27 WR<sup>2</sup>*

### FAN PERFORMANCE:

RPM: *1287*  
 BHP: *0.61*  
 Efficiency: *52.6%*  
 In/Out Velocity: */FPM*  
 Plenum Out Velocity: *24 FPM*

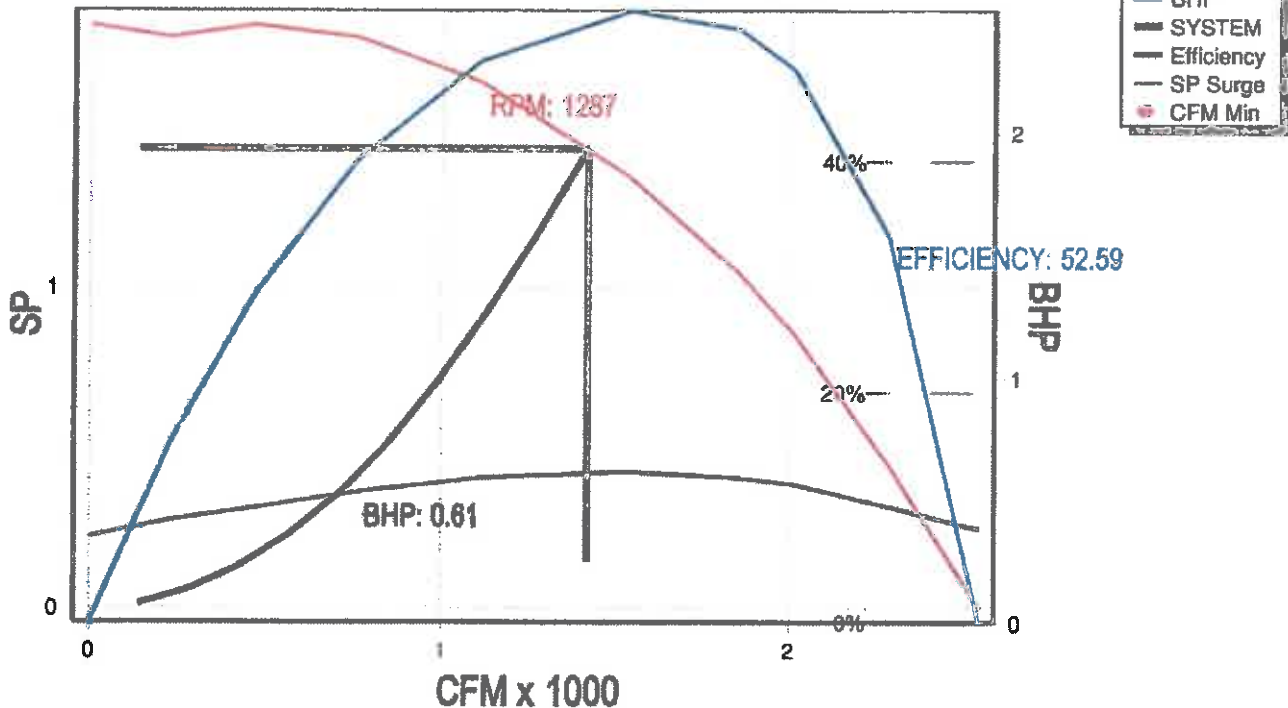
### FAN SOUND POWER (Inlet/Outlet):

Octave Band:		(Re 10 <sup>-12</sup> watts)							
1	2	3	4	5	6	7	8		
78	79	78	75	70	68	64	59		
78	79	78	75	70	68	64	59		

SOUND POWER A-Weighted: *79 / 79 dB*

Max Duct SP with Blocked Airway: *1.8 in. Wg. @ 1287 rpm*

Supply Fan Model: RQ185-VFD @ 1287 RPM and 100% Width  
 Design Conditions: 1415 CFM @ 1.43" SP





# Unit Submittal

2425 South Yukon Ave - Tulsa, Oklahoma 74107-3728 - Ph. (918) 583-2266 Fax (918) 583-0094  
AAONEcat82 Ver 4.267 (SN 6168192-)

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 13 13 14A 14B 15 16 17 18 19 20 21 22 23

**RQ-004-8-V-EA09-334:A000-DOB-QJD-00C-C0DAABE-00-0000000VB**  
Tag: RTU# 3 & 4

Job Name: *Summit County Childrens Services Training Center Phoenix*      Unit Submittal For:  
Job Number:      Unit Submittal Date: *March 12, 2018*

	Base Option	Description
<b>R</b>	Series	Roof Top Unit
<b>Q</b>	Generation	Tenth Generation
<b>004</b>	Unit Size	Four
<b>3</b>	Voltage	208V/3Ø/60Hz
<b>V</b>	Interior Protection	Vertical Discharge and Return
<b>E</b>	Refrigerant Style	R-410A Variable Capacity Scroll Compressor (VCC) - High Efficiency
<b>A</b>	Unit Configuration	Air-Cooled Cond. + Std Evap. Coil
<b>Q</b>	Coil Coating	Standard
<b>9</b>	Cooling/Heat Pump Staging	Modulating - 1 Variable Capacity Compressor
<b>3</b>	Heating Type	Natural Gas Stainless Steel
<b>3</b>	Heating Designation	Heat 3 - 100 MBtu/h
<b>4</b>	Heating Staging	4 Stage

	Feature Option	Description
<b>A</b>	1A. RA/OA Section	Economizer
<b>Q</b>	1B. RA/EA Blower Configuration	Standard - None
<b>Q</b>	1C. RA/EA Blower	Standard - None
<b>Q</b>	1D. RA/EA Blower Motor	Standard - None
<b>D</b>	2. OA Control	Fully Modulating Actuator - Enthalpy Limit
<b>Q</b>	3. Heat Options	Standard
<b>E</b>	4. Maintenance Options	115V Convenience Outlet - Factory Wired
<b>Q</b>	5A. SA Blower Configuration	1 Blower + Inverter Rated 3 Phase Motor + VFD
<b>J</b>	5B. SA Blower	19" Direct Drive Backward Curved Plenum
<b>D</b>	5C. SA Motor	2 HP 1760 rpm
<b>Q</b>	6A. Pre Filter Type	Standard - None
<b>Q</b>	6B. Unit Filter Type	2" Pleated - MERV 8
<b>C</b>	6C. Filter Options	Clogged Filter Switch + Magnehelic Gauge
<b>C</b>	7. Refrigeration Control	Adjustable Fan Cycling
<b>Q</b>	8. Refrigeration Options	Standard
<b>E</b>	9. Refrigeration Accessories	ECM Condenser Fan - Multiple Speed
<b>A</b>	10. Power Options	Non-fused Disconnect Power Switch - 100 Amps
<b>A</b>	11. Safety Options	RA and SA Firestat
<b>B</b>	12. Controls	Phase & Brown Out Protection
<b>E</b>	13. Special Controls	Constant Volume (CV) Unit Controller - CV Cool + CV Heat
<b>Q</b>	14A. Preheat Configuration	Standard - None
<b>Q</b>	14B. Preheat Sizing	Standard - None
<b>Q</b>	15. Glycol Percent	Water or No WSHP
<b>Q</b>	16. Interior Cabinet Options	Standard - Double Wall + R-13 Foam Insulation + Stainless Steel Drain Pan
<b>Q</b>	17. Exterior Cabinet Options	Standard
<b>Q</b>	18. Customer Code	Standard
<b>Q</b>	19. Code Options	Standard - ETL U.S.A. Listing
<b>Q</b>	20. Crating	Standard
<b>Q</b>	21. Water-Cooled Cond.	Standard - None
<b>V</b>	22. Control Vendors	VCCX w/ BACnet MSTP
<b>B</b>	23. Type	Standard - Includes AAON Gray Paint



# VCCX Components

3425 South Yukon Ave • Tulsa, Oklahoma 74107-9728 • Ph. (918) 581-2266 Fax (918) 583-0094  
AAONEnt32 Ver 4.267 (SN: 6108102-1)

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

**RQ-004-8-V-EA09-334 : A000-D0B-QJD-00C-C0DAABE-00-0000000VB**

Tag: RTU# 3 & 4

Job Name:

*Summit County Childrens  
Services Training Center  
Phoenix*

VCCX For:

Job Number:

VCCX Date:

*March 12, 2018*

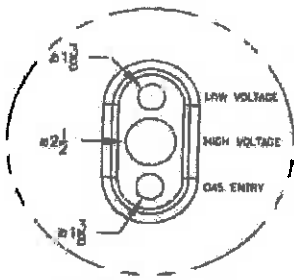
### Hardware Included For VCCX Controller

Part #	Included Parts	Assigned Channel	BACnet Point
V87900	VCCX CONTROLLER		
P94320	Space Temp Sensor	VCCX control point AI 1	AI:12
V13050	OSA Temp/Hum Sensor	EBUS2 communicating sensor	AI:16, AI:17, AI:18, AI:19
P94320	Space Temp Slide Adjust	VCCX control point AI 2	AI:8
RS2890	Supply Temp Sensor - Field Installed	VCCX control point AI 3	AI:9
	Supply Fan Control Signal 0-10VDC	VCCX control point AO 1	AI:22
	Economizer	VCCX control point AO 2	AI:30
R66830	Proof of Air Flow	VCCX control point BI 1	BI:6
R64880	Dirty Filter Sensor	VCCX control point BI 2	BI:25
	Safety Shut Down	VCCX control point BI 8	BI:26
	Supply Fan	Configured Relay point	BI:63
	Heat 1	Configured Relay Point	BI:64
	Heat 2	Configured Relay Point	BI:65
	Heat 3	Configured Relay Point	BI:66
	Heat 4	Configured Relay Point	BI:67
V61520	DIGITAL REFRIGERATION MODULE		
R57800	Comp Discharge Temp A	RSMD point TEMP1	AI:56
V88891	Suction Pressure Sensor A	RSMD point AI1	AI:48
	Comp Status Input A	RSMD point BIN1	
	Emergency Shutdown	RSMD point BIN4	BI:81, 82
	Condenser Enable AB	RSMD Fixed Relay point	BI:78, BI:85
	Comp Enable A	RSMD Fixed Relay point	AI:46

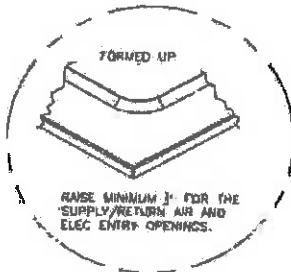
# RQ CABINET ECONOMIZER VERTICAL ~ 1-6 TON

CLEARANCES	
LOCATION	UNIT SIZE 1-6 TON
OUTSIDE AIR (BACK)	36"
HXC (FRONT)	36"
LEFT SIDE	24"
RIGHT SIDE	48"
TOP	UNOBSTRUCTED

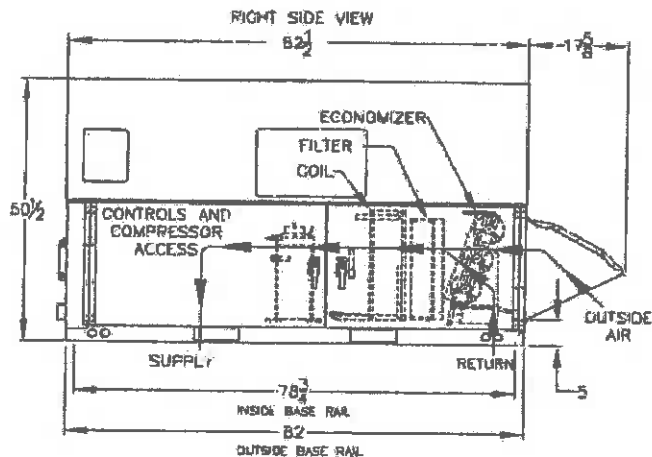
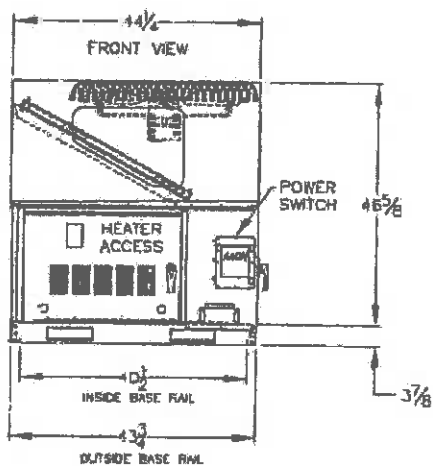
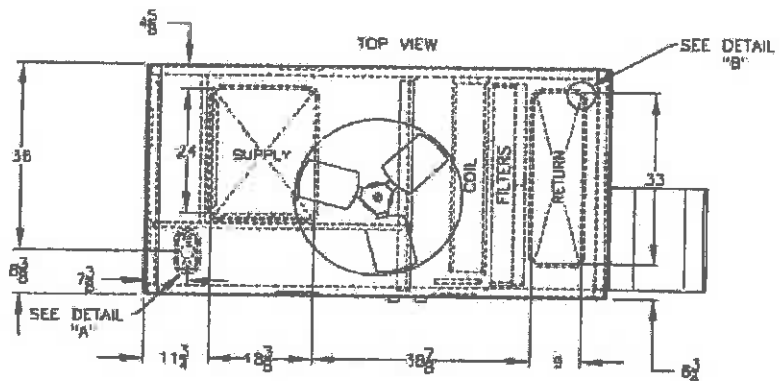
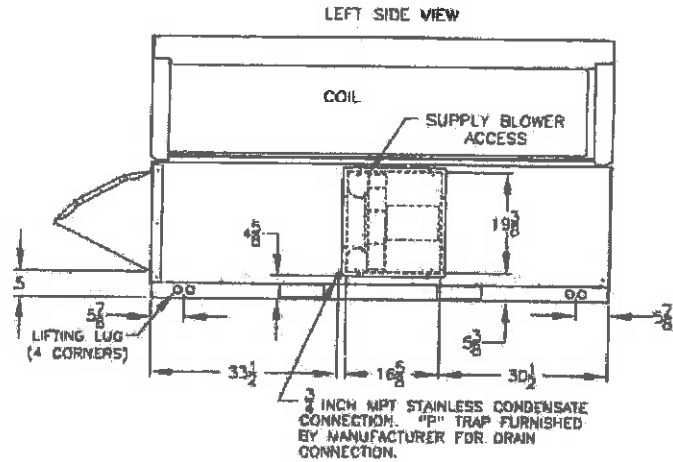
**\*CLEARANCE IS MEASURED FROM THE END OF THE OUTSIDE AIR RAIN HOOD**



**DETAIL A**



**DETAIL B**



RQ-00007 REV:E 04/12/16 AAS  
NOTE: ALL DIMENSIONS ARE IN INCHES

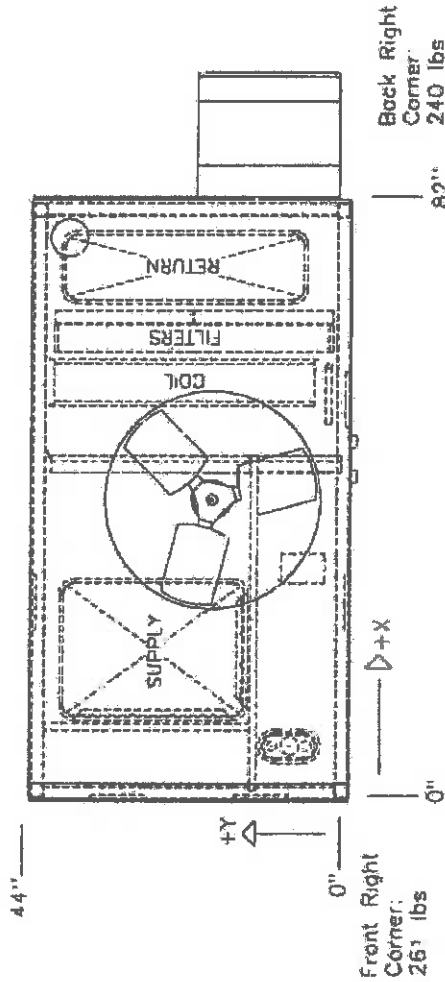


# RQ CABINET VERTICAL AIR COOLED CONDENSING UNIT

RQ-004-8-V-EA09-334-A000-D0B-QJD-00C-CODAABE-00-00000000VB

Back Left Corner:  
211 lbs

Front Left  
Corner:  
229 lbs



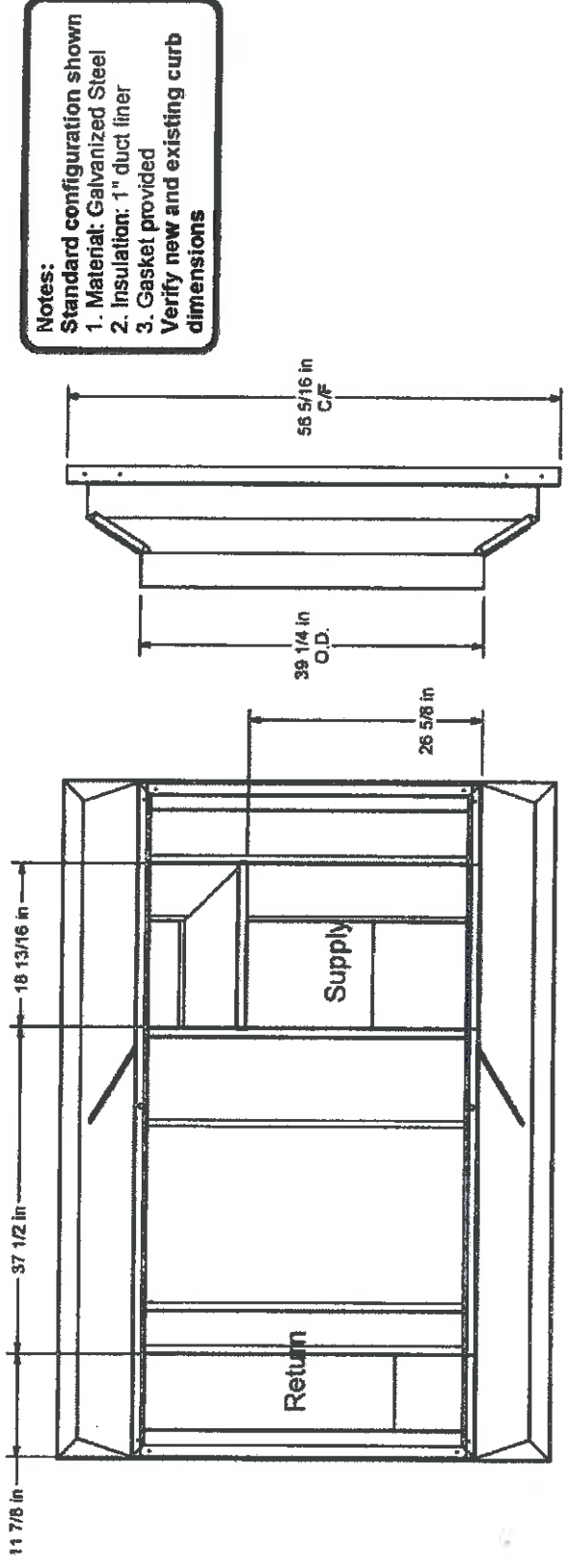
Front Right  
Corner:  
261 lbs

Back Right  
Corner:  
240 lbs

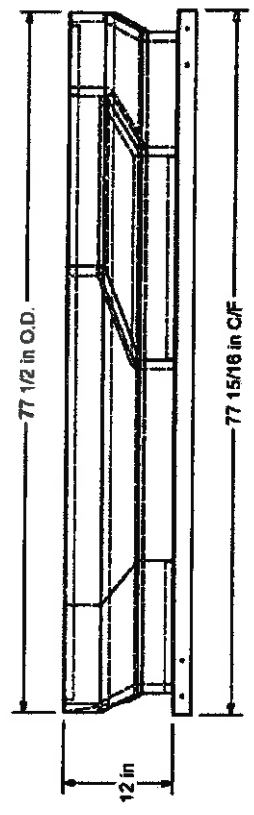
CGx: 39.3"  
CGy: 20.5"

Total Weight:  
941 lbs (±5%)

Disclaimer:  
This weight estimate does not account for any SPAS



Plan



**Notes:**  
**Standard configuration shown**  
 1. Material: Galvanized Steel  
 2. Insulation: 1" duct liner  
 3. Gasket provided  
**Verify new and existing curb dimensions**

The information contained in this drawing is the sole property of Thybar Corporation. Any reproduction in part or whole without the written consent of Thybar Corporation is prohibited. (DO NOT SCALE DRAWING) Unless otherwise specified dimensions are in inches tolerances are $\pm 1/16$ $\pm 0.0025$ $\pm 1^*$		Retromate Standard New Acon RQ 002-006 Standard Existing Acon A CAB, R_02-07	Retromate Weight lbs. Total Weight 125 lbs.
QTY:	Job #:		
Tag:			
Drawn:			
File:			
Date: 3/7/2017	Rev:	AN03753AN00074	B



# Unit Rating

2125 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph: (918) 583-3266 Fax: (918) 583-4094  
AADN@aadn.com Ver: 4.267 (SN: 0108192)

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22

**RQ-004-8-V-EA09-334 : A000-DOB-QJD-00C-CODAABE-00-0000000VB**

Tag: RTU# 5

### Job Information

Job Name: Summit County Childrens Services Training  
 Job Number: Center  
 Site Altitude: Phoenix  
 Refrigerant: 0 fl  
 R-410A

### Unit Information

Approx. Op./Ship Weights: 941 / 941 lbs. (±5%)  
 Supply CFM/ESP:  
 Final Filter FV / Qty: 1515 / 0.55 in. wg.  
 Outside CFM: 272.70 fpm / 2  
 Ambient Temperature: 450  
 Return Temperature: 88.6 °F DB / 72.6 °F WB  
 75 °F DB / 62 °F WB

### Static Pressure

External: 0.55 in. wg.  
 Evaporator: 0.23 in. wg.  
 Filters Clean: 0.10 in. wg.  
 Dirt Allowance: 0.35 in. wg.

Economizer: 0.09 in. wg.  
 Heating: 0.13 in. wg.  
 Cabinet: 0.05 in. wg.  
 Total: 1.49 in. wg.

### Cooling Section

	Gross	Net
Total Capacity:	52.12	50.02 MBH
Sensible Capacity:	40.95	38.84 MBH
Latent Capacity:	11.17 MBH	
Mixed Air Temp:	79.00 °F DB	65.00 °F WB
Entering Air Temp:	79.00 °F DB	65.00 °F WB
Lv Air Temp (Coil):	53.52 °F DB	53.06 °F WB
Lv Air Temp (Unit):	54.79 °F DB	53.59 °F WB
Digital Comp. Capacity Ratio:	100%	
Supply Air Fan:	1 x RQ185-VFD @ 0.67 BHP	
SA Fan RPM / Width:	1330 / 3.000"	
Evaporator Coil:	5.3 ft <sup>2</sup> / 4 Rows / 14 FPI	
Evaporator Face Velocity:	288.6 fpm	

### Heating Section

PreHeat Type: Std (No Preheat)  
 Heating Type: Nat. Gas Heat  
 Heating CFM: 1515  
 Total Capacity: 81.0 MBH  
 OA Temp: 0.0 DB / -1.0°F WB  
 RA Temp: 70.0 °F DB / 53.0 °F WB  
 Entering Air Temp: 51.0 °F DB / 38.5 °F WB  
 Leaving Air Temp: 100.6 °F DB / 60.4 °F WB  
 Input: 100.0 MBH  
 Heater Qty (Hi/Low): 1  
 Consumption: 100.0 MBH  
 Operation: N/A  
 Total Turndown Ratio: 3.5:1

### Rating Information

Cooling Capacity (MBH): 50.0  
 Cooling SEER: 15.7  
 Cooling EER: 13.3  
 Rated in accordance with AHRI 210/240

Application EER @ Op. Conditions: 13.2

### Electrical Data

Rating:	208/3/60			Minimum Circuit Amp:	30		
Unit FLA:	26			Maximum Overcurrent:	45		
	Qty	HP	VAC	Phase	RPM	FLA	RLA
Compressor 1:	1		208	3			16.1
Condenser Fans:	1	0.333	208	1	1110	2.8	
Supply Fan:	1	2.00	208	3	1760	7.5	
Combustion:	1	0.09	208	1	3000	1.3	

### Cabinet Sound Power Levels\*

Octave Bands:	63	125	250	500	1000	2000	4000	8000
Discharge LW(dB):	79	79	80	73	68	66	62	56
Return LW(dB):	75	75	70	61	60	57	52	44

\*Sound power levels are given for informational purposes only. The sound levels are not guaranteed.





# 18.5" STAR Plenum

3425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6091  
AAONE-032 Ver. 4.267 (SN- 6188182-)

### JOB INFORMATION:

Job Name: *Summit County Childrens Services Training Center*  
 Job Tag: *RTU# 5*  
 Rep Firm: *500*  
 Date: *03/12/2018*  
*03/12/2018*

### WHEEL SPECIFICATION:

Max RPM: *2,300*  
 Diameter x Qty: *18.5 in. x 1*  
 CFM: *1515*  
 Tip Speed: *6,442 FPM*  
 Inertia: *6,442 FPM*

### OPERATING CONDITIONS:

Air Flow: *1,515 CFM*  
 Static Pressure: *1.49 in. Wg.*  
 Relief Dampers DP: *0.00 in. Wg.*  
 TSP: *1.49 in. Wg.*  
 Site Altitude: *0.00 Ft*  
 TSP @ Sea Level: *1.49 in. Wg.*

### MOTOR SELECTION:

Rated HP / Bypass: *2 / No*  
 Frame Size: *48*  
 Nominal RPM: *1760*  
 VAC/PH/Hz: *208/3/60*  
 Efficiency: *Standard / 0.815*  
 Enclosure Type: *ODP*  
 Max Inertial Load: *27 WR²*

### FAN PERFORMANCE:

RPM: *1330*  
 BHP: *0.67*  
 Efficiency: *52.9%*  
 In/Out Velocity: */FPM*  
 Plenum Out Velocity: *35 FPM*

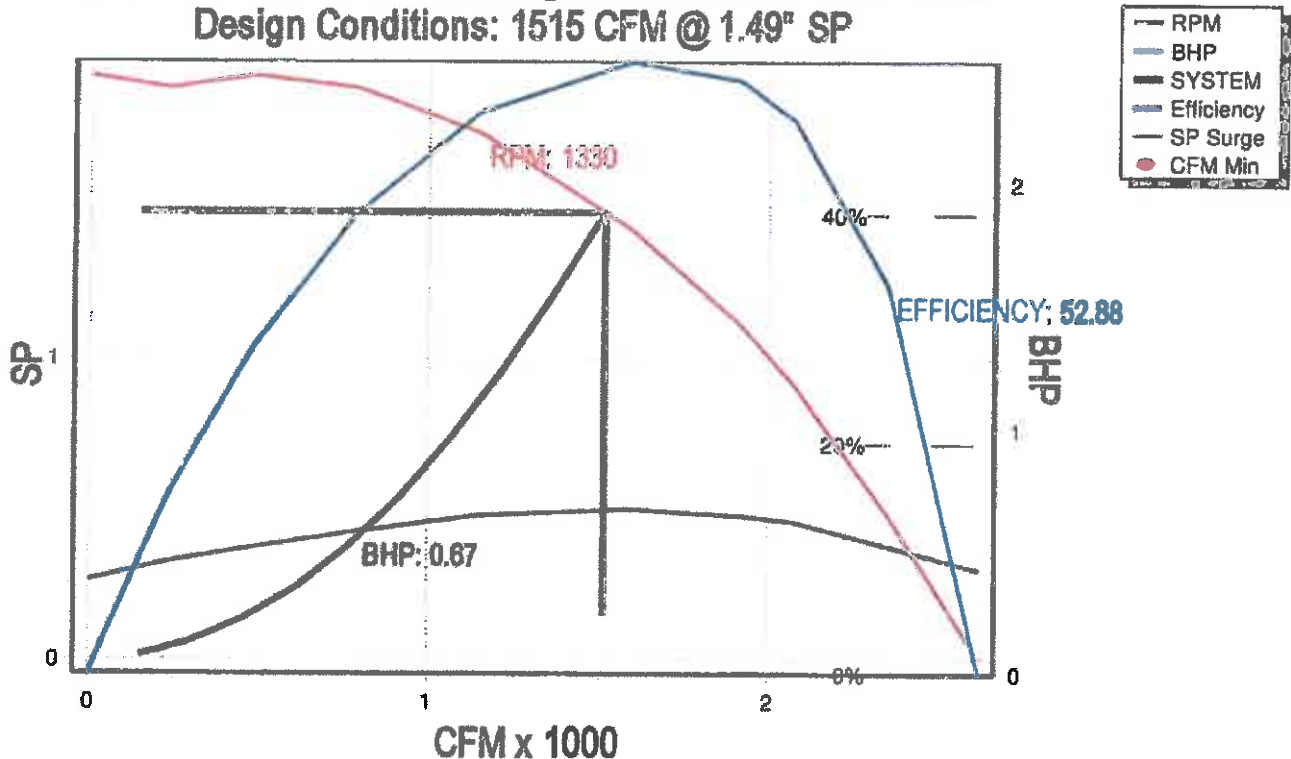
### FAN SOUND POWER (Inlet/Outlet):

Octave Band:	(Re 10 <sup>-12</sup> watts)							
	1	2	3	4	5	6	7	8
	79	79	80	75	71	69	66	60
	79	79	80	75	71	69	66	60

SOUND POWER A-Weighted: 80 / 80 dB

Max Duct SP with Blocked Airway: *1.9 in. Wg. @ 1330 rpm*

Supply Fan Model: RQ185-VFD @ 1330 RPM and 100% Width  
 Design Conditions: 1515 CFM @ 1.49" SP





# Unit Submittal

2425 South Yukon Ave. - Tulsa, Oklahoma 74107-2728 - Ph (918) 583-2266 Fax (918) 583-6094  
AAONEca32 Ver. 4.267 (SN: 6198192-1)

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

**RQ-004-8-V-EA09-334:A000-DOB-QJD-00C-CODAABE-00-0000000VB**

Tag: RTU# 5

Job Name:

Summit County Childrens Services Training Center  
Phoenix

Unit Submittal For:

Job Number:

Unit Submittal Date:

March 12, 2018

	Base Option	Description
R	Series	Root Top Unit
Q	Generation	Tenth Generation
004	Unit Size	Four
0	Voltage	208V/3Ø/60Hz
V	Interior Protection	Vertical Discharge and Return
E	Refrigerant Style	R-410A Variable Capacity Scroll Compressor (VCC) - High Efficiency
A	Unit Configuration	Air-Cooled Cond. + Std Evap. Coil
0	Coil Coating	Standard
0	Cooling/Heat Pump Staging	Modulating - 1 Variable Capacity Compressor
3	Heating Type	Natural Gas Stainless Steel
3	Heating Designation	Heat 3 - 100 MBtu/h
4	Heating Staging	4 Stage

	Feature Option	Description
A	1A. RA/OA Section	Economizer
0	1B. RA/EA Blower Configuration	Standard - None
0	1C. RA/EA Blower	Standard - None
0	1D. RA/EA Blower Motor	Standard - None
D	2. QA Control	Fully Modulating Actuator - Enthalpy Limit
0	3. Heat Options	Standard
B	4. Maintenance Options	115V Convenience Outlet - Factory Wired
Q	5A. SA Blower Configuration	1 Blower + Inverter Rated 3 Phase Motor + VFD
J	5B. SA Blower	19" Direct Drive Backward Curved Plenum
D	5C. SA Motor	2 HP 1760 rpm
0	6A. Pre Filter Type	Standard - None
0	6B. Unit Filter Type	2" Pleated - MERV 8
C	6C. Filter Options	Glogged Filter Switch + Magnetic Gauge
C	7. Refrigeration Control	Adjustable Fan Cycling
0	8. Refrigeration Options	Standard
D	9. Refrigeration Accessories	ECM Condenser Fan - Multiple Speed
A	10. Power Options	Non-fused Disconnect Power Switch - 100 Amps
A	11. Safety Options	RA and SA Firestat
E	12. Controls	Phase & Brown Out Protection
E	13. Special Controls	Constant Volume (CV) Unit Controller - CV Cool + CV Heat
0	14A. Preheat Configuration	Standard - None
0	14B. Preheat Sizing	Standard - None
0	15. Glycol Percent	Water or No WSHP
0	16. Interior Cabinet Options	Standard - Double Wall + R-13 Foam Insulation + Stainless Steel Drain Pan
0	17. Exterior Cabinet Options	Standard
0	18. Customer Code	Standard
0	19. Code Options	Standard - ETL U.S.A. Listing
0	20. Crating	Standard
0	21. Water-Cooled Cond.	Standard - None
V	22. Control Vendors	VCCX w/ BACnet MSTP
E	23. Type	Standard - Includes AAON Gray Paint



# VCCX Components

2426 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 589-6004  
 AACNEcat32 Ver. 4.267 (SN 6104192-)

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

**RQ-004-8-V-EA09-334 : A000-D0B-QJD-00C-CODAAAE-00-0000000VB**

Tag: RTU# 5

Job Name:

*Summit County Childrens  
 Services Training Center  
 Phoenix*

VCCX For:

Job Number:

VCCX Date:

**March 12, 2018**

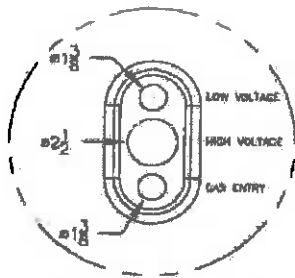
### Hardware Included For VCCX Controller

Part #	Included Parts	Assigned Channel	BACnet Point
V87900	VCCX CONTROLLER		
P94320	Space Temp Sensor	VCCX control point AI 1	AI:12
V13050	OSA Temp/Hum Sensor	EBUS2 communicating sensor	AI:16, AI:17, AI:18, AI:19
P94320	Space Temp Slide Adjust	VCCX control point AI 2	AI:8
R82890	Supply Temp Sensor - Field Installed	VCCX control point AI 3	AI:9
	Supply Fan Control Signal 0-10VDC	VCCX control point AO 1	AO:22
	Economizer	VCCX control point AO 2	AO:30
R82890	Proof of Air Flow	VCCX control point BI 1	BI:6
R64590	Dirty Filter Sensor	VCCX control point BI 2	BI:25
	Safety Shut Down	VCCX control point BI 8	BI:26
	Supply Fan	Configured Relay point	BI:63
	Heat 1	Configured Relay Point	BI:64
	Heat 2	Configured Relay Point	BI:65
	Heat 3	Configured Relay Point	BI:66
	Heat 4	Configured Relay Point	BI:67
V81520	DIGITAL REFRIGERATION MODULE		
R57800	Comp Discharge Temp A	RSMD point TEMP1	AI:56
V88301	Suction Pressure Sensor A	RSMD point AI1	AI:48
	Comp Status Input A	RSMD point BIN1	
	Emergency Shutdown	RSMD point BIN4	BI:81, 82
	Condenser Enable AB	RSMD Fixed Relay point	BI:78, BI:85
	Comp Enable A	RSMD Fixed Relay point	AI:46

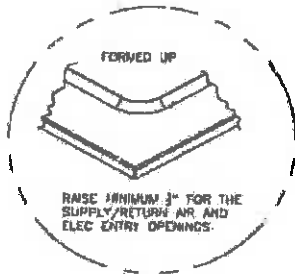
# RQ CABINET ECONOMIZER VERTICAL ~ 1-6 TON

CLEARANCES	
LOCATION	• UNIT SIZE • 1-6 TON
OUTSIDE AIR (BACK)	36*
HXC (FRONT)	36
LEFT SIDE	24
RIGHT SIDE	48
TOP	UNOBSTRUCTED

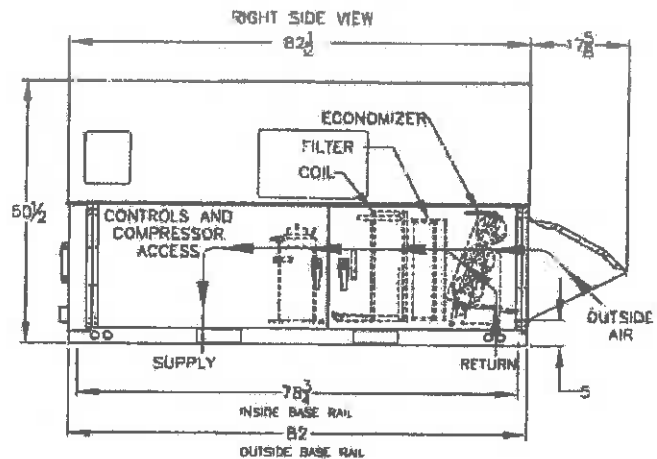
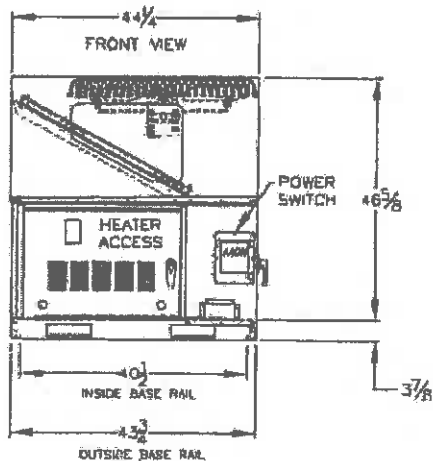
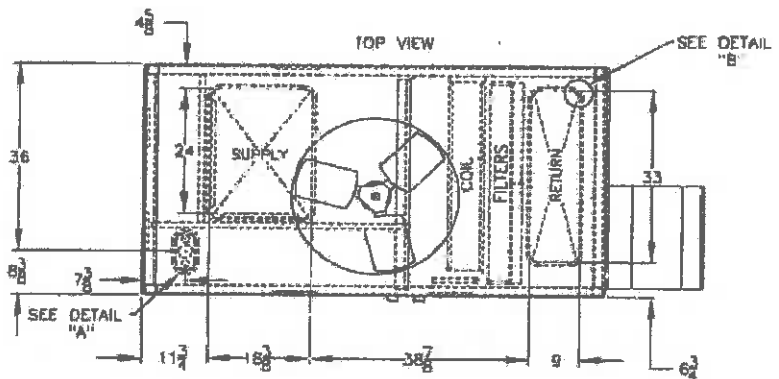
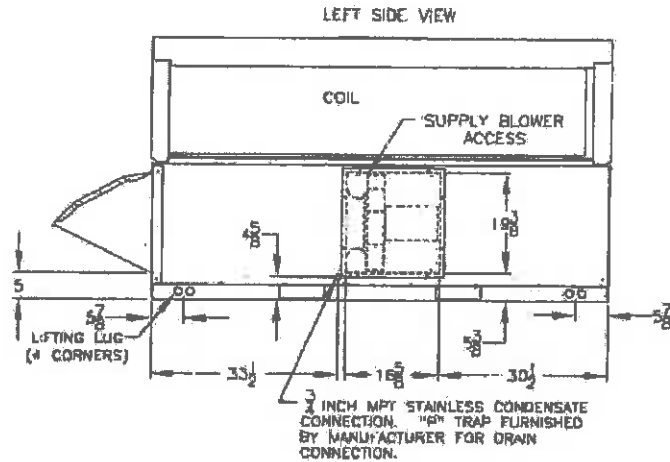
\*CLEARANCE IS MEASURED FROM THE END OF THE OUTSIDE AIR RAIN HOOD



DETAIL A



DETAIL B



RQ-00007 REV:E 04/12/16 AAS  
NOTE ALL DIMENSIONS ARE IN INCHES

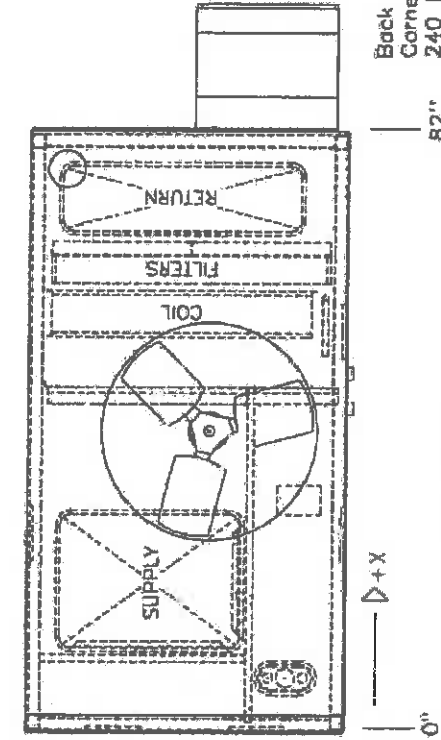


# RQ CABINET VERTICAL AIR COOLED CONDENSING UNIT

RQ-004-8-V-EA09-334A000-DOB-QJD-00C-CODAABE-00-0000000VB

Back Left Corner:  
211 lbs

Front Left Corner:  
228 lbs



Front Right Corner:  
261 lbs

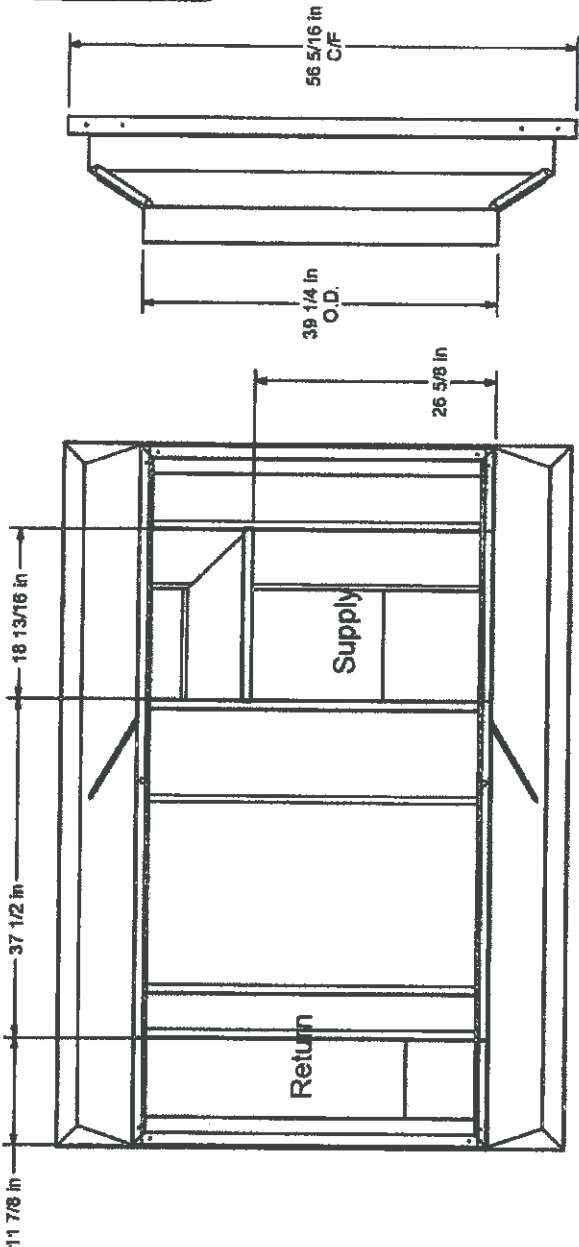
Back Right Corner:  
240 lbs

CGX: 39.3"  
CGY: 20.5"

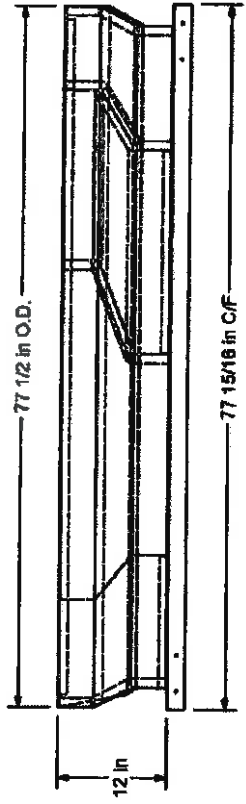
Total Weight:  
941 lbs (±5%)

Disclaimer:  
This weight estimate does not account for any SPAs.

**Notes:**  
 Standard configuration shown  
 1. Material: Galvanized Steel  
 2. Insulation: 1" duct liner  
 3. Gasket provided  
 Verify new and existing curb dimensions



Plan



This information contained in this drawing is the sole property of Thybar Corporation. Any reproduction in part or whole without the written consent of Thybar Corporation is prohibited. (DO NOT SCALE DRAWING) Unless otherwise specified dimensions are in inches tolerances are ± 1/16 ± 0.0025 ± 1'	Reformat Standard New Aaon RQ 002-006 Standard Existing Aaon A CAB. R_02-07	Reformat Weight lbs. Total Weight 125 lbs.
	QTY.: Job #: Tag: Drawn: HJL/UA Date: 3/7/2017	New B



# Unit Rating

2426 South Yukon Ave - Tulsa, Oklahoma 74107-2723 - Ph (918) 583-2266 Fax (918) 583-6094  
AAONEcon32 Ver. 4.267 (SN: 6166163.1)

1A 1B 1C 1D 2 3 4 5A 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

**RQ-004-8-V-EA09-354 : A000-DOB-QJD-00C-C0DAABE-00-0000000VB**  
Tag: RTU# 6

### Job Information

Job Name: Summit County Childrens Services Training  
Job Number: Center  
Site Altitude: Phoenix  
Refrigerant: 0 ft  
R-410A

### Unit Information

Approx. Op./Ship Weights: 955 / 955 lbs. (±5%)  
Supply CFM/ESP:  
Final Filter FV / Qty: 1750 / 0.55 in. wg.  
Outside CFM: 315.00 fpm / 2  
Ambient Temperature: 600  
Return Temperature: 88.6 °F DB / 72.6 °F WB  
75 °F DB / 62 °F WB

### Static Pressure

External: 0.55 in. wg.  
Evaporator: 0.27 in. wg.  
Filters Clean: 0.12 in. wg.  
Dirt Allowance: 0.35 in. wg.

Economizer: 0.11 in. wg.  
Heating: 0.10 in. wg.  
Cabinet: 0.07 in. wg.  
Total: 1.57 in. wg.

### Cooling Section

	Gross	Net
Total Capacity:	53.49	50.95 MBH
Sensible Capacity:	44.39	41.85 MBH
Latent Capacity:	9.11 MBH	
Mixed Air Temp:	79.00 °F DB	65.00 °F WB
Entering Air Temp:	79.00 °F DB	65.00 °F WB
Lv Air Temp (Coil):	55.10 °F DB	54.47 °F WB
Lv Air Temp (Unit):	56.43 °F DB	55.01 °F WB
Digital Comp. Capacity Ratio:	100%	
Supply Air Fan:	1 x RQ185-VFD @ 0.81 BHP	
SA Fan RPM / Width:	1417 / 3.000"	
Evaporator Coil:	5.3 ft <sup>2</sup> / 4 Rows / 14 FPI	
Evaporator Face Velocity:	333.3 fpm	

### Heating Section

PreHeat Type: Std (No Preheat)  
Heating Type: Nat. Gas Heat  
Heating CFM: 1750  
Total Capacity: 113.4 MBH  
OA Temp: 0.0 DB / -1.0 °F WB  
RA Temp: 70.0 °F DB / 53.0 °F WB  
Entering Air Temp: 48.0 °F DB / 38.6 °F WB  
Leaving Air Temp: 108.0 °F DB / 64.1 °F WB  
Input: 140.0 MBH  
Heater Qty (Hi/Low): 1  
Consumption: 140.0 MBH  
Operation: N/A  
Total Turndown Ratio: 5:1

### Rating Information

Cooling Capacity (MBH): 50.0  
Cooling SEER: 15.7  
Cooling EER: 13.3

Rated in accordance with AHRI 210/240

Application EER @ Op. Conditions: 13.0

### Electrical Data

Rating: 208/3/60  
Unit FLA: 26

Minimum Circuit Amp: 30  
Maximum Overcurrent: 45

	Qty	HP	VAC	Phase	RPM	FLA	RLA
Compressor 1:	1		208	3			16.1
Condenser Fans:	1	0.333	208	1	1110	2.8	
Supply Fan:	1	2.00	208	3	1760	7.5	
Combustion:	1	0.09	208	1	3000	1.3	

### Cabinet Sound Power Levels\*

Octave Bands:	63	125	250	500	1000	2000	4000	8000
Discharge LW(dB):	80	80	81	75	69	68	63	58
Return LW(dB):	76	76	71	63	61	60	53	46

\*Sound power levels are given for informational purposes only. The sound levels are not guaranteed.



# 18.5" STAR Plenum

3425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 Ph. (918) 583-2266 Fax (918) 583-6094  
AAONEca82 Ver 4.267 (SN: 6168192)

### JOB INFORMATION:

Job Name: Summit County Childrens  
 Job Tag: Services Training Center  
 Rep Firm: RTU# 6  
 Date: 500  
 03/12/2018  
 03/12/2018

### WHEEL SPECIFICATION:

Max RPM: 2,200  
 Diameter x Qty: 18.5 in. x 1  
 CFM: 1750  
 Tip Speed: 6,863 FPM  
 Inertia: 6,863 FPM

### OPERATING CONDITIONS:

Air Flow: 1,750 CFM  
 Static Pressure: 1.57 in. Wg.  
 Relief Dampers DP: 0.00 in. Wg.  
 TSP: 1.57 in. Wg.  
 Site Altitude: 0.00 Ft  
 TSP @ Sea Level: 1.57 in. Wg.

### MOTOR SELECTION:

Rated HP / Bypass: 2 / No  
 Frame Size: 48  
 Nominal RPM: 1760  
 VAC/PH/Hz: 208/3/60  
 Efficiency: Standard / 0.815  
 Enclosure Type: ODP  
 Max Inertial Load: 27 WR'

### FAN PERFORMANCE:

RPM: 1417  
 BHP: 0.81  
 Efficiency: 53.2%  
 In/Out Velocity: /FPM  
 Plenum Out Velocity: 29 FPM

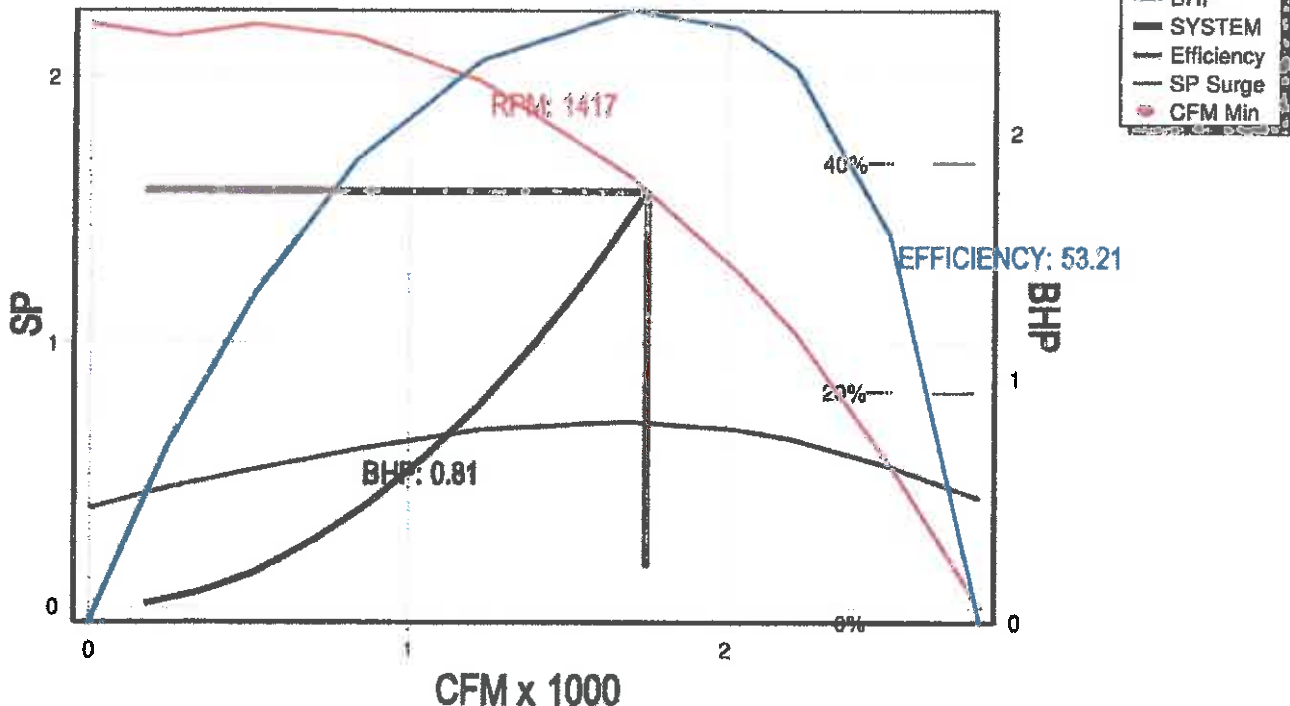
### FAN SOUND POWER (Inlet/Outlet):

Octave Band:	(Re 10 <sup>-12</sup> watts)							
	1	2	3	4	5	6	7	8
	80	80	81	77	72	71	67	62
	80	80	81	77	72	71	67	62

SOUND POWER A-Weighted: 82 / 82 dB

Max Duct SP with Blocked Airway: 2.2 in. Wg. @ 1417 rpm

Supply Fan Model: RQ185-VFD @ 1417 RPM and 100% Width  
 Design Conditions: 1750 CFM @ 1.57" SP







# Unit Submittal

2425 South Yukon Ave. Tulsa, Oklahoma 74107-2728 Ph (918) 583-2266 Fax (918) 583-6094  
AAONEcat32 Ver. 4.267 (SN: 6198192)

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

**RQ-004-8-V-EA09-354:A000-DOB-QJD-00C-CDDAABE-00-0000000VB**  
Tag: RTU# 6

Job Name: Summit County Childrens Services Training Center  
Job Number: Phoenix  
Unit Submittal For: Phoenix  
Unit Submittal Date: March 12, 2018

	Base Option	Description
<b>R</b>	Series	Roof Top Unit
<b>Q</b>	Generation	Tenth Generation
<b>004</b>	Unit Size	Four
<b>8</b>	Voltage	208V/3Ø/60Hz
<b>V</b>	Interior Protection	Vertical Discharge and Return
<b>E</b>	Refrigerant Style	R-410A Variable Capacity Scroll Compressor (VCC) - High Efficiency
<b>A</b>	Unit Configuration	Air-Cooled Cond. + Std Evap. Coil
<b>Q</b>	Coil Coating	Standard
<b>9</b>	Cooling/Heat Pump Staging	Modulating - 1 Variable Capacity Compressor
<b>3</b>	Heating Type	Natural Gas Stainless Steel
<b>5</b>	Heating Designation	Heat 5 - 140 MBtu/h
<b>4</b>	Heating Staging	4 Stage

	Feature Option	Description
<b>A</b>	1A. RA/OA Section	Economizer
<b>8</b>	1B. RA/EA Blower Configuration	Standard - None
<b>0</b>	1C. RA/EA Blower	Standard - None
<b>0</b>	1D. RA/EA Blower Motor	Standard - None
<b>2</b>	2. OA Control	Fully Modulating Actuator - Enthalpy Limit
<b>3</b>	3. Heat Options	Standard
<b>4</b>	4. Maintenance Options	115V Convenience Outlet - Factory Wired
<b>5A</b>	5A. SA Blower Configuration	1 Blower + Inverter Rated 3 Phase Motor + VFD
<b>5B</b>	5B. SA Blower	19" Direct Drive Backward Curved Plenum
<b>5C</b>	5C. SA Motor	2 HP 1760 rpm
<b>6A</b>	6A. Pre Filter Type	Standard - None
<b>6B</b>	6B. Unit Filter Type	2" Pleated - MERV 8
<b>6C</b>	6C. Filter Options	Clogged Filter Switch + Magnetic Gauge
<b>7</b>	7. Refrigeration Control	Adjustable Fan Cycling
<b>8</b>	8. Refrigeration Options	Standard
<b>9</b>	9. Refrigeration Accessories	ECM Condenser Fan - Multiple Speed
<b>10</b>	10. Power Options	Non-fused Disconnect Power Switch - 100 Amps
<b>11</b>	11. Safety Options	RA and SA Freezat
<b>12</b>	12. Controls	Phase & Brown Out Protection
<b>13</b>	13. Special Controls	Constant Volume (CV) Unit Controller - CV Cool + CV Heat
<b>14A</b>	14A. Preheat Configuration	Standard - None
<b>14B</b>	14B. Preheat Sizing	Standard - None
<b>15</b>	15. Glycol Percent	Water or No WSHp
<b>16</b>	16. Interior Cabinet Options	Standard - Double Wall + R-13 Foam Insulation + Stainless Steel Drain Pan
<b>17</b>	17. Exterior Cabinet Options	Standard
<b>18</b>	18. Customer Code	Standard
<b>19</b>	19. Code Options	Standard - ETL U.S.A. Listing
<b>20</b>	20. Crating	Standard
<b>21</b>	21. Water-Cooled Cond.	Standard - None
<b>22</b>	22. Control Vendors	VCCX w/ BACnet MSTP
<b>23</b>	23. Type	Standard - Includes AAON Gray Paint



# VCCX Components

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph: (918) 583-2200 Fax: (918) 683-6094  
AAONEcont2 Ver. 4.267 (SN: 6198192-)

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 A P 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

**RQ-004-8-V-EA09-354 : A000-D0B-QJD-00C-C0DAABE-00-0000000VB**

Tag: RTU# 6

Job Name:

*Summit County Childrens  
Services Training Center  
Phoenix*

VCCX For:

Job Number:

VCCX Date:

**March 12, 2018**

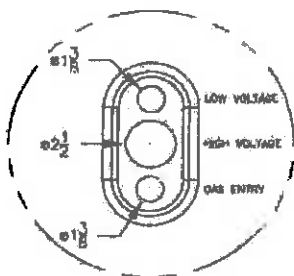
### Hardware Included For VCCX Controller

Part#	Included Parts	Assigned Channel	BACnet Point
V87900	VCCX CONTROLLER		
P94320	Space Temp Sensor	VCCX control point AI 1	AI:12
V13050	OSA Temp/Hum Sensor	EBUS2 communicating sensor	AI:16, AI:17, AI:18, AI:19
P94320	Space Temp Slide Adjust	VCCX control point AI 2	AI:8
R82890	Supply Temp Sensor - Field Installed	VCCX control point AI 3	AI:9
	Supply Fan Control Signal 0-10VDC	VCCX control point AO 1	AO:22
	Economizer	VCCX control point AO 2	AO:30
R62350	Proof of Air Flow	VCCX control point BI 1	BI:6
R64590	Dirty Filter Sensor	VCCX control point BI 2	BI:25
	Safety Shut Down	VCCX control point BI 8	BI:26
	Supply Fan	Configured Relay point	BI:63
	Heat 1	Configured Relay Point	BI:64
	Heat 2	Configured Relay Point	BI:65
	Heat 3	Configured Relay Point	BI:66
	Heat 4	Configured Relay Point	BI:67
V61620	DIGITAL REFRIGERATION MODULE		
R57500	Comp Discharge Temp A	RSMD point TEMP1	AI:56
V28931	Suction Pressure Sensor A	RSMD point AI1	AI:48
	Comp Status Input A	RSMD point BIN1	
	Emergency Shutdown	RSMD point BIN4	BI:81, 82
	Condenser Enable AB	RSMD Fixed Relay point	BI:78, BI:85
	Comp Enable A	RSMD Fixed Relay point	AI:46

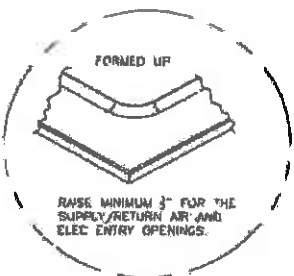
# RQ CABINET ECONOMIZER VERTICAL ~ 1-6 TON

CLEARANCES	
LOCATION	• UNIT SIZE •
	1-6 TON
OUTSIDE AIR (BACK)	36*
HXC (FRONT)	36
LEFT SIDE	24
RIGHT SIDE	48
TOP	UNOBSTRUCTED

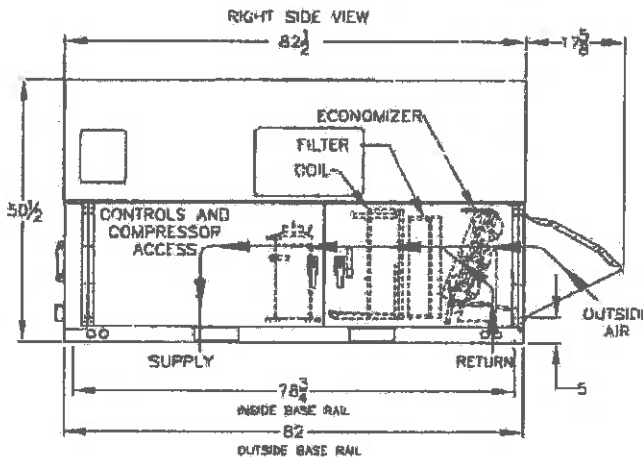
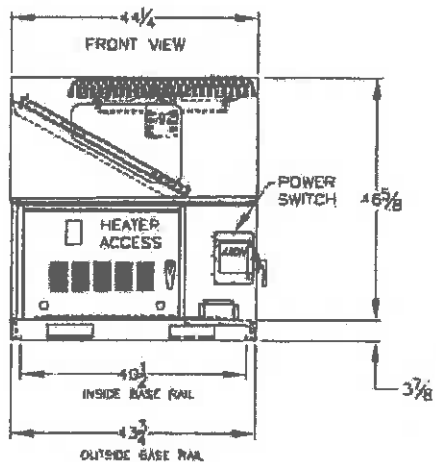
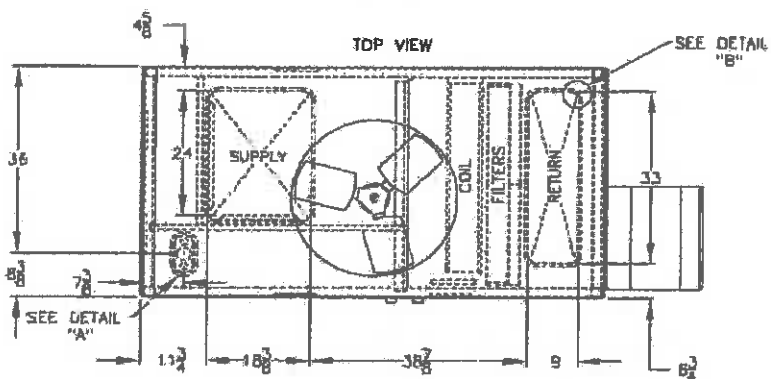
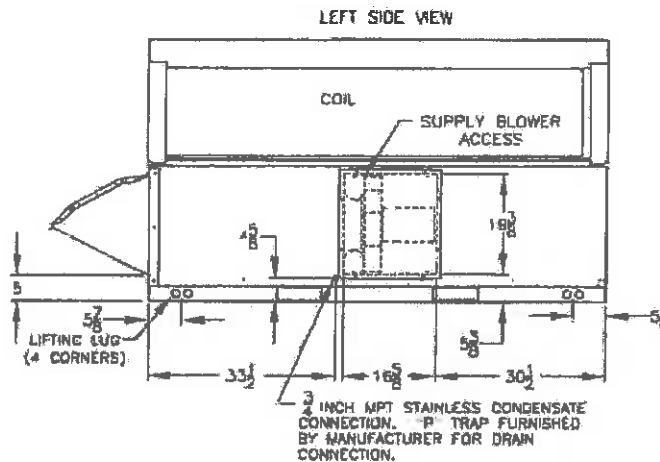
\*CLEARANCE IS MEASURED FROM THE END OF THE OUTSIDE AIR RAIN HOOD



DETAIL A



DETAIL B



RQ-00007 REV E 04/12/16 AAS  
NOTE: ALL DIMENSIONS ARE IN INCHES

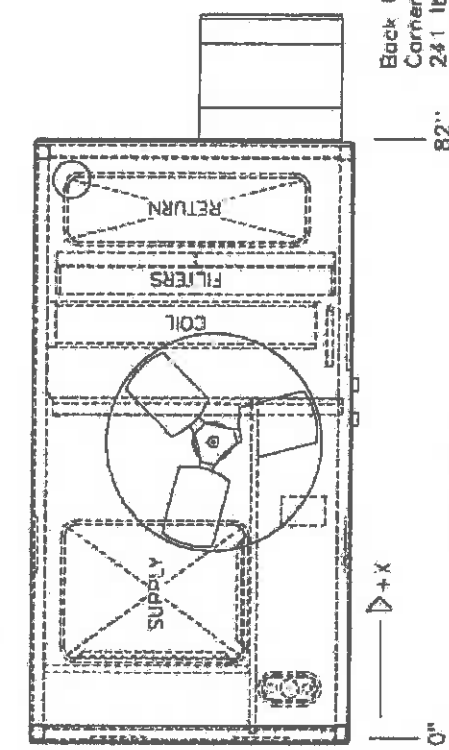
# RQ CABINET VERTICAL AIR COOLED CONDENSING UNIT



RQ-004-8-V-EA09-354:A000-DOB-QJD-00C-CODABE-00-00000000VB

Back Left Corner  
213 lbs

Front Left Corner  
235 lbs



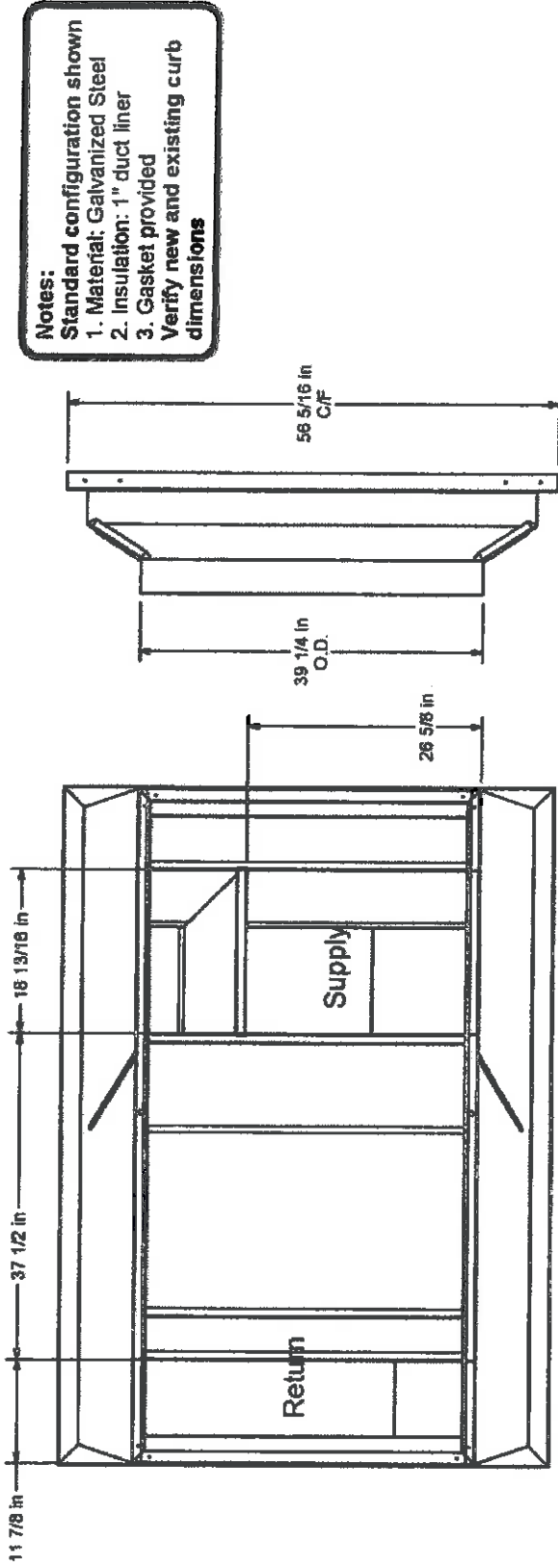
Front Right Corner  
266 lbs

Back Right Corner  
241 lbs

CGx: 39"  
CGy: 20.5"

Total Weight:  
955 lbs (±5%)

**Disclaimer:**  
This weight estimate does not account for any SPAS



Plan

**Notes:**  
 Standard configuration shown  
 1. Material: Galvanized Steel  
 2. Insulation: 1" duct liner  
 3. Gasket provided  
 Verify new and existing curb dimensions

This information contained in this drawing is the sole property of Thybar Corporation. Any reproduction in part or whole without the written consent of Thybar Corporation is prohibited. (DO NOT SCALE DRAWINGS) Unless otherwise specified dimensions are in inches tolerances are $\pm 1/16 \pm 0.0025 \pm 1^*$	Retiromate Standard New Aeon RQ 002-006 Standard Existing Aeon A CAB. R_02-07	Retiromate Weight lbs. Total Weight 125 lbs.
	QTY.: Tag: Drawn: HJL/UB	Job #: Rev: B
Date: 3/7/2017	AN03753AN00074	E-Code: 003-1524 right

## Section 15000 - Packaged Rooftop Units

### Part 1 - General

#### 1.01 Related Documents

#### 1.02 General Description

- A. This section includes the design, controls and installation requirements for packaged rooftop units/heat pumps/outdoor air handling units.

#### 1.03 Quality Assurance

- A. Packaged air-cooled condenser units shall be certified in accordance with ANSI/AHRI Standard 340/360 performance rating of commercial and industrial unitary air-conditioning and heat pump equipment.
- B. Unit shall be certified in accordance with UL Standard 1995/CSA C22.2 No. 236, Safety Standard for Heating and Cooling Equipment.
- C. Unit and refrigeration system shall comply with ASHRAE 15, Safety Standard for Mechanical Refrigeration.
- D. Unit shall be certified in accordance with ANSI Z21 47b/CSA 2.3b and ANSI Z83.8/CSA 2.6, Safety Standard Gas-Fired Furnaces.
- E. Unit Seasonal Energy Efficiency Ratio (SEER) shall be equal to or greater that prescribed by ASHRAE 90.1, Energy Efficient Design of New Buildings except Low-Rise Residential Buildings.
- F. Unit shall be safety certified by ETL and ETL US listed. Unit nameplate shall include the ETL/ETL Canada label.
- G. Unit shall be approved for use in and outside High Velocity Hurricane Zones (HVHZ) by the Florida Building Code (FL# 15031), when using the required steel rooftop curb and attachment methods. Maximum allowable lateral wind pressure is +100psf/-100psf. Maximum allowable uplift is +50psf/-50psf. Positive and negative required design pressures calculated for use with this system shall be determined by others on a job specific basis, in accordance with the governing code. Site specific pressures shall be less than or equal to the listed positive or negative allowable lateral wind design pressure and allowable uplift values for the product.

#### 1.04 Submittals

- A. Product Data: Literature shall be provided that indicates dimensions, operating and shipping weights, capacities, ratings, fan performance, filter information, factory supplied accessories, electrical characteristics and connection requirements. Installation, Operation and Maintenance manual with startup requirements shall be provided.

- B. Shop Drawings: Unit drawings shall be provided that indicate assembly, unit dimensions, construction details, clearances and connection details. Computer generated fan curves for each fan shall be submitted with specific design operation point noted. Wiring diagram shall be provided with details for both power and control systems and differentiate between factory installed and field installed wiring.

#### **1.05 Delivery, Storage, and Handling**

- A. Unit shall be shipped with doors bolted shut and outside air hood closed to prevent damage during transport and thereafter while in storage awaiting installation.
- B. Follow Installation, Operation and Maintenance manual instructions for rigging, moving, and unloading the unit at its final location.
- C. Unit shall be stored in a clean, dry place protected from construction traffic in accordance with the Installation, Operation and Maintenance manual.

#### **1.06 Warranty**

- A. Manufacturer shall provide a limited "parts only" warranty for a period of 24 months from the date of original equipment shipment from the factory. Warranty shall cover material and workmanship that prove defective, within the specified warranty period, provided manufacturer's written instructions for installation, operation and maintenance have been followed. Warranty excludes parts associated with routine maintenance, such as belts and air filters.

#### **1.07 Startup Repair Program**

- A. Manufacturer shall provide startup repair for a period of 12 months from the date of original equipment shipment from the factory. Program shall cover labor for materials and workmanship that prove defective, within the specified warranty period, provided manufacturer's written instructions for installation, operation and maintenance have been followed. Program excludes labor associated with routine maintenance, such as belt and air filter replacement.

### **Part 2 - Products**

#### **2.01 Manufacturer**

- A. Products shall be provided by the following manufacturers:
  - 1. AAON
  - 2. Substitute equipment may be considered for approval that includes at a minimum:
    - a. R-410A refrigerant
    - b. Direct drive supply fans

- c. Double wall cabinet construction
- d. Insulation with a minimum R-value of 13
- e. Stainless steel drain pans
- f. Hinged access doors with lockable handles
- g. Variable capacity compressor with 10-100% capacity
- h. All other provisions of the specifications must be satisfactorily addressed

## **2.02 Rooftop Units**

### **A. General Description**

- 1. Packaged rooftop unit shall include compressor, evaporator coil, filters, supply fan, dampers, air-cooled condenser coils, condenser fan, gas heater, and unit controls.
- 2. Unit shall be factory assembled and tested including leak testing of the DX coils, pressure testing of the refrigeration circuit, and run testing of the completed unit. Run test report shall be supplied with the unit in the service compartment's literature pocket.
- 3. Unit shall have decals and tags to indicate lifting and rigging, service areas and caution areas for safety and to assist service personnel.
- 4. Unit components shall be labeled, including refrigeration system components and electrical and controls components.
- 5. Estimated sound power levels (dB) shall be shown on the unit ratings sheet.
- 6. Installation, Operation and Maintenance manual shall be supplied within the unit.
- 7. Laminated color-coded wiring diagram shall match factory installed wiring and shall be affixed to the interior of the control compartment's hinged access door.
- 8. Unit nameplate shall be provided in two locations on the unit, affixed to the exterior of the unit and affixed to the interior of the control compartment's hinged access door.

### **B. Construction**

- 1. All cabinet walls, access doors, and roof shall be fabricated of double wall, impact resistant, rigid polyurethane foam panels.
- 2. Unit insulation shall have a minimum thermal resistance R-value of 13. Foam insulation shall have a minimum density of 2 pounds/cubic foot and shall be tested in accordance with ASTM D-1929 for a minimum flash ignition



temperature of 610°F.

3. Unit construction shall be double wall with G90 galvanized steel on both sides and a thermal break. Double wall construction with a thermal break prevents moisture accumulation on the insulation, provides a cleanable interior, prevents heat transfer through the panel, and prevents exterior condensation on the panel.
4. Unit shall be designed to reduce air leakage and infiltration through the cabinet. Cabinet leakage shall not exceed 1% of total airflow when tested at 3 times the minimum external static pressure provided in AHRI Standard 210/240. Panel deflection shall not exceed L/240 ratio at 125% of design static pressure, at a maximum 8 inches of positive or negative static pressure, to reduce air leakage. Deflection shall be measured at the midpoint of the panel height and width. Continuous sealing shall be included between panels and between access doors and openings to reduce air leakage. Piping and electrical conduit through cabinet panels shall include sealing to reduce air leakage.
5. Roof of the air tunnel shall be sloped to provide complete drainage. Cabinet shall have rain break overhangs above access doors.
6. Access to filters, dampers, cooling coil, heater, compressor, and electrical and controls components shall be through hinged access doors with quarter turn, lockable handles. Full length stainless steel piano hinges shall be included on the doors.
7. Exterior paint finish shall be capable of withstanding at least 2,500 hours, with no visible corrosive effects, when tested in a salt spray and fog atmosphere in accordance with ASTM B 117-95 test procedure.
8. Units shall include double sloped 304 stainless steel drain pans.
9. Unit shall be provided with through the base vertical discharge and return air openings. All openings through the unit shall have upturned flanges of at least 1/2 inch around the opening.
10. Unit shall include lifting lugs on the top of the unit.

#### C. Electrical

1. Unit shall be provided with factory installed and factory wired, non-fused disconnect switch.
2. Unit shall be provided with a factory installed and factory wired 115V, 12 amp GFI outlet disconnect switch in the unit control panel.
3. Unit shall be provided with phase and brown out protection which shuts down all motors in the unit if the electrical phases are more than 10% out of balance on voltage, the voltage is more than 10% under design voltage or on phase reversal.

#### D. Supply Fans

1. Unit shall include direct drive, unhooded, backward curved, plenum supply fans.
2. Blowers and motors shall be dynamically balanced.
3. Motor shall be inverter rated efficiency ODP with ball bearings rated for 200,000 hours service with external lubrication points.
4. Variable frequency drive shall be factory wired and mounted in the unit. Fan motor shall be inverter rated efficiency.

#### E. Cooling Coils

1. Evaporator Coils
  - a. Coils shall be designed for use with R-410A refrigerant and constructed of copper tubes with aluminum fins mechanically bonded to the tubes and aluminum end casings. Fin design shall be sine wave rippled.
  - b. Coil shall be standard capacity
  - c. Coils shall be helium hydrogen or helium leak tested.
  - d. Coils shall be furnished with factory installed electronic expansion valves.

#### F. Refrigeration System

1. Unit shall be factory charged with R-410A refrigerant.
2. Compressors shall be scroll type with thermal overload protection and carry a 5 year non-prorated warranty, from the date of original equipment shipment from the factory.
3. Compressors shall be mounted in an isolated service compartment which can be accessed without affecting unit operation. Lockable hinged compressor access doors shall be fabricated of double wall, rigid polyurethane foam injected panels to prevent the transmission of noise outside the cabinet.
4. Compressors shall be isolated from the base pan with the compressor manufacturer's recommended rubber vibration isolators, to reduce any transmission of noise from the compressors into the building area.
5. Each refrigeration circuit shall be equipped with thermostatic expansion valve type refrigerant flow control.
6. Each refrigeration circuit shall be equipped with automatic reset low pressure and manual reset high pressure refrigerant safety controls, Schrader type service fittings on both the high pressure and low pressure sides and a factory installed replaceable core liquid line filter driers.

7. Unit shall include a variable capacity scroll compressor on the refrigeration circuit which shall be capable of modulation from 10-100% of its capacity.

#### G. Condensers

1. Air-Cooled Condenser
  - a. Condenser fans shall be a vertical discharge, axial flow, direct drive fans.
  - b. Coils shall be designed for use with R-410A refrigerant.
  - c. Condenser coils shall be multi-pass and fabricated from aluminum microchannel tubes.
  - d. Coils shall be designed for a minimum of 10°F of refrigerant sub-cooling.
  - e. Coils shall be hydrogen or helium leak tested.
  - f. Condenser fans shall be high efficiency electrically commutated motor driven with multiple speeds which are controlled with a fan cycle switch based on head pressure and allow matching condenser airflow with cooling capacity steps.

#### H. Gas Heating

1. Unit shall include a natural gas furnace with 4 stages of capacity control.
2. Stainless steel heat exchanger furnace shall carry a 25 year non-prorated warranty, from the date of original equipment shipment from the factory.
3. Gas furnace shall consist of stainless steel heat exchangers with multiple concavities, an induced draft blower and an electronic pressure switch to lockout the gas valve until the combustion chamber is purged and combustion airflow is established.
4. Furnace shall include a gas ignition system consisting of an electronic igniter to a pilot system, which will be continuous when the heater is operating, but will shut off the pilot when heating is not required.
5. Unit shall include a single gas connection and have gas supply piping entrances in the unit base for through-the-curb gas piping and in the outside cabinet wall for across the roof gas piping.

#### I. Filters

1. Unit shall include 2 inch thick, fiberglass throwaway filters with an ASHRAE MERV rating of 8, upstream of the cooling coil.
2. Unit shall include a clogged filter switch.
3. Units shall include a Magnehelic gauge mounted in the controls compartment.

**J. Outside Air/Economizer**

1. Unit shall include 0-100% economizer consisting of a motor operated outside air damper and return air damper assembly constructed of extruded aluminum, hollow core, airfoil blades with rubber edge seals and aluminum end seals. Damper blades shall be gear driven and designed to have no more than 15 CFM of leakage per sq. ft. of damper area when subjected to 2 inches w.g. air pressure differential across the damper. Unit shall include outside air opening bird screen, outside air hood with rain lip and barometric relief dampers.
2. Damper assembly shall be controlled by spring return enthalpy activated fully modulating actuator.

**K. Controls**

**1. Factory Installed and Factory Provided Controller**

- a. Unit controller shall be capable of controlling all features and options of the unit. Controller shall be factory installed in the unit controls compartment and factory tested.
- b. Controller shall be capable of standalone operation with unit configuration, set point adjustment, sensor status viewing, unit alarm viewing, and occupancy scheduling available without dependence on a building management system.
- c. Controller shall have an onboard clock and calendar functions that allow for occupancy scheduling.
- d. Controller shall include non-volatile memory to retain all programmed values without the use of a battery, in the event of a power failure.

**e. Constant Volume Controller**

1. Unit shall modulate cooling with constant airflow to meet space temperature cooling loads.
2. Unit shall modulate heating with constant airflow to meet space temperature heating loads. Staged heating capacity shall modulate based on space temperature.

**L. Accessories**

1. Unit shall be provided with a Firestats sensing the return and supply air of the unit, wire to shut off the unit's control circuit.

**2.03 Curbs**

**A. 12" Adapter Curb**

### **Part 3 - Execution**

#### **3.01 Installation, Operation and Maintenance**

- A. Installation, Operation and Maintenance manual shall be supplied with the unit.
- B. Installing contractor shall install unit, including field installed components, in accordance with Installation, Operation and Maintenance manual instructions.
- C. Start up and maintenance requirements shall be complied with to ensure safe and correct operation of the unit.