



JOC Sales, LLC
1200 West 13 Mile Road
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PACKAGED ROOFTOP UNIT SUBMITTAL

PROJECT: Shango Grow Facility
155 South Saginaw St
Lapeer MI 48446

PROJECT: 21-0234
CONTRACTOR: Kapala Heating & Air Conditioning
DATE: June 11, 2021
COMPILED BY: Jerome FitzGerald
JOC Sales LLC
jfitzgerald@jocsales.com
www.jocsales.com
248-646-6680



SHANGO LAPEER MI GROW FACILITY

Packaged Rooftop Units:

<u>Qty</u>	<u>Serves</u>	<u>AAON Model</u>	<u>Input Heating kW</u>	<u>General Description</u>
1	Mother Room	RQ-004	20 kW	Packaged CAV Rooftop Unit
2	Veg Rooms	RN-008	20 kW	Packaged CAV Rooftop Unit
4	Flower Rooms	RN-030	60 kW	Packaged CAV Rooftop Unit
4	Flower Rooms	RN-030	60 kW	Packaged CAV Rooftop Unit W/Power Exhaust
1	Dry Room	RN-008	20 kW	Packaged CAV Rooftop Unit
2	North Bldg Offices	RQ-005	140 MBH	Packaged CAV Rooftop Unit

Rooftop Unit Features:

- Power Exhaust units include extended cabinet, VFD, 4" deep carbon filters, and fully modulating economizer
- North Building Offices RQ-005 units include fully modulating economizer
- 2 inch double wall construction and stainless steel drain pan
- Copeland variable capacity digital scroll compressors on lead circuit
- Copeland on/off scroll compressor on lag circuit
- High capacity 6 row evaporator coil (not North Bldg Offices RQ-005's)
- Modulating hot gas reheat dehumidification on all circuits (not North Bldg Offices RQ-005's)
- Variable speed condenser fan head pressure control
- Flooded condenser zero degree low ambient (not North Building Offices RQ-005's)
- SCR controlled electric heat
- 100% return air – NO outside air (not units with power exhaust)
- Direct drive, backward inclined, plenum style supply fan W/VFD
- Factory mounted and wired non-fused disconnect and unit powered 115V GFI outlet
- Unit nameplated for simultaneous heating and cooling (not North Bldg Offices RQ-005's)
- 2" MERV 8 pre-filters & 4" MERV 13 final-filters
- Factory mounted and wired AAON DDC controls with BACnet MSTP
 - supply duct temp sensors and space temp & RH sensors ship loose for field mounting and wiring by others
 - Units to be daisy chained by others
 - Remote access via customer supplied IT drop
- Horizontal discharge curb (RN Models)
- Start up & programming of controls



MOTHER ROOM UNIT



Unit Rating

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.307 (SN: 6554592-8QXGX130)

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-004-3-H-EB09-11A:5000-00B-QJD-AG0-01EAH03-00-0000000VX

Tag: RTU - Mother Room

(Values do not account for changes described in SPA)

Job Information

Job Name: Shango Lapeer Grow Facility
Job Number: 21-0234
Site Altitude: 0 ft
Refrigerant: R-410A

Unit Information

**WEIGHT AND PERFORMANCE DO NOT INCLUDE SPA

Approx. Op./Ship Weights: 893 / 893 lbs. (±5%)
Supply CFM/ESP: 2200 / 0.75 in. wg.
Pre-Filter FV / Qty: 396.00 fpm / 2
Final Filter FV / Qty: 396.00 fpm / 2
Ambient Temperature: 95 °F DB / 75 °F WB
Return Temperature: 78 °F DB / 71.9 °F WB

Static Pressure

External: 0.75 in. wg.
Evaporator: 0.59 in. wg.
Filters Clean: 0.45 in. wg.
Dirt Allowance: 0.25 in. wg.

Economizer: 0.42 in. wg.
Heating: 0.22 in. wg.
Cabinet: 0.18 in. wg.
Total: 2.94 in. wg.

Cooling Section

	Gross	Net
Total Capacity:	63.01	57.01 MBH
Sensible Capacity:	33.74	27.74 MBH
Latent Capacity:	29.27 MBH	
Mixed Air Temp:	78.00 °F DB	71.90 °F WB
Entering Air Temp:	78.00 °F DB	71.90 °F WB
Lv Air Temp (Coil):	63.57 °F DB	63.47 °F WB
Lv Air Temp (Unit):	66.04 °F DB	64.31 °F WB
Digital Comp. Capacity Ratio:	100%	
Supply Air Fan:	1 x RQ185-VFD @ 1.92 BHP	
SA Fan RPM / Width:	1886 / 3.000"	
Evaporator Coil:	5.3 ft ² / 6 Rows / 14 FPI	
Evaporator Face Velocity:	419.0 fpm	

Heating Section

PreHeat Type: Std (No Preheat)
Heating Type: Electric Heat
Heating CFM: 2200
Total Capacity: 34.1 MBH
OA Temp: 0.0 DB / 0.0 °F WB
RA Temp: 78.0 °F DB / 71.9 °F WB
Entering Air Temp: 78.0 °F DB / 71.9 °F WB
Leaving Air Temp: 92.4 °F DB / 75.8 °F WB
Bypass CFM: 0
Input: 10.0 kW
Heater Qty (Hi/Low): 1
Electric Heat FLA: 12

Re-Heat Coil:

Capacity: 34 MBH
LA DB / WB: 78.00 °F / 68.15 °F
RH: 61%

Rating Information

Cooling Capacity (MBH): 51.5
Cooling SEER: 15.9
Cooling EER: 13.6
Rated in accordance with AHRI 210/240

Application EER @ Op. Conditions: 11.0

2200	Supply Air CFM
78.0°FDB @ 75% RH	Indoor Design Conditions
108.6	Indoor Design GR/LB
78.0/68.15	AHU LAT °FDB/°FWB
87.8	AHU LAT GR/LB
29.42	LBS/HR Moisture Removal Capacity at 78.0°FDB @ 75% RH Room Design Conditions

Electrical Data

Rating: 460/3/60
Unit FLA: 15 ²⁵
SCCR: 5 KAIC

Minimum Circuit Amp: 19 ³⁰
Maximum Overcurrent: 20 ³⁰

	Qty	HP	VAC	Phase	RPM	FLA	RLA
Compressor 1:	1		460	3			7.8
Condenser Fans:	1	0.333	460	1	1110	1.6	
Supply Fan:	1	2.00	460	3	1760	3.4	

Cabinet Sound Power Levels*

Octave Bands:	63	125	250	500	1000	2000	4000	8000
Discharge LW(dB):	87	85	88	84	77	75	72	67
Return LW(dB):	81	79	77	71	67	63	56	47

*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) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.307 (SN: 6554592-8QXGX130)

JOB INFORMATION:

Job Name: Shango Lapeer Grow Facility
Job Tag: RTU - Mother Room
Rep Firm: Jerome FitzGerald
Date: 06/11/2021
06/11/2021

WHEEL SPECIFICATION:

Max RPM: 2,200
Diameter x Qty: 18.5 in. x 1
CFM: 2200
Tip Speed: 9,134 FPM
Inertia: 9,134 FPM

OPERATING CONDITIONS:

Air Flow: 2,200 CFM
Static Pressure: 2.94 in. Wg.
Relief Dampers DP: 0.00 in. Wg.
TSP: 2.94 in. Wg.
Site Altitude: 0.00 Ft
TSP @ Sea Level: 2.94 in. Wg.

MOTOR SELECTION:

Rated HP / Bypass: 2 / No
Frame Size: 48
Nominal RPM: 1760
VAC/PH/Hz: 460/3/60
Efficiency: Standard / 0.815
Enclosure Type: ODP
Max Inertial Load: 27 WR²

FAN PERFORMANCE:

RPM: 1886
BHP: 1.92
Efficiency: 53.0%
In/Out Velocity: /FPM
Plenum Out Velocity: 37 FPM

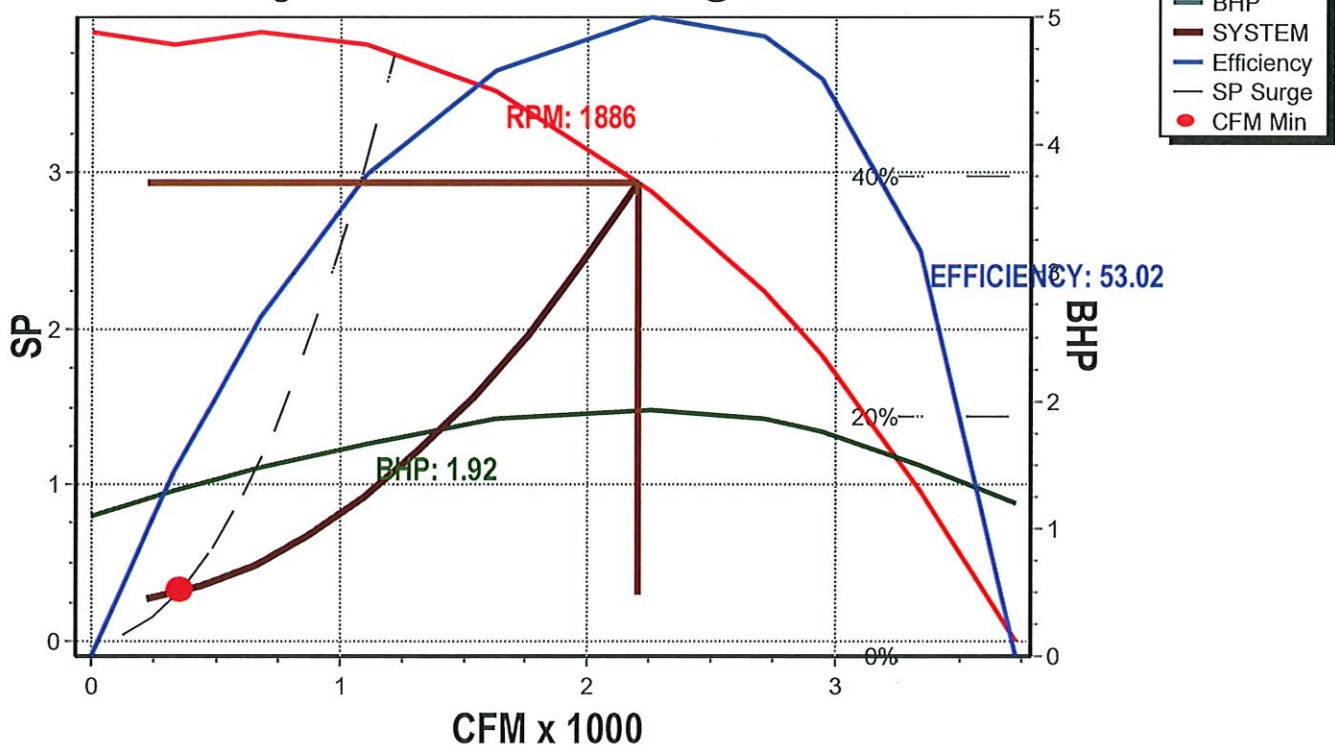
FAN SOUND POWER (Inlet/Outlet):

Octave Band:		(Re 10 ⁻¹² watts)					
1	2	3	4	5	6	7	8
87	85	88	86	80	78	76	71
87	85	88	86	80	78	76	71

SOUND POWER A-Weighted: 89 / 89 dB

Max Duct SP with Blocked Airway: 3.9 in. Wg. @ 1886 rpm

Supply Fan Model: RQ185-VFD @ 1886 RPM and 100% Width Design Conditions: 2200 CFM @ 2.94" SP





Unit Submittal

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RQ-004-3-H-EB09-11A:5000-00B-QJD-AG0-01EAH03-00-0000000VX

Tag: RTU - Mother Room

Job Name:
Job Number:

Shango Lapeer Grow Facility
21-0234

Unit Submittal For:
Unit Submittal Date:

June 11, 2021

	Base Option	Description
R	Series	Roof Top Unit
Q	Generation	Tenth Generation
004	Unit Size	Four
3	Voltage	460V/3Ø/60Hz
H	Interior Protection	Horizontal Discharge and Return
E	Refrigerant Style	R-410A Variable Capacity Scroll Compressor (VCC) - High Efficiency
B	Unit Configuration	Air-Cooled Cond. + 6 Row Evap. Coil
0	Coil Coating	Standard
9	Cooling/Heat Pump Staging	Modulating - 1 Variable Capacity Compressor
1	Heating Type	Electric Heat
1	Heating Designation	Heat 1 - 10 kW
A	Heating Staging	Modulating/SCR Electric - 0-10V Control Signal

	Feature Option	Description
5	1A. RA/OA Section	100% Return Air (No O/A Opening)
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	Standard - None
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
A	6A. Pre Filter Type	2" Pleated Pre Filter - 30% Eff
G	6B. Unit Filter Type	4" Pleated - 85% Eff - MERV 13
0	6C. Filter Options	Standard
0	7. Refrigeration Control	Standard - Adj Comp. Cooling Lock Out Through Unit Controls
1	8. Refrigeration Options	Parallel Modulating Hot Gas Reheat Microchannel Coil [MHGR-MC]
E	9. Refrigeration Accessories	ECM Condenser Fan - Head Pressure Control
A	10. Power Options	Non-fused Disconnect Power Switch - 100 Amps
H	11. Safety Options	Remote Safety Shutdown Terminals
0	12. Controls	Standard
3	13. Special Controls	VAV Single Zone Unit Controller - VAV Cool + VAV Heat
0	14A. Outside Air 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. Electrical Rating	Standard - 5 KAIC
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
X	23. Type	Special Price Authorization + AAON Gray Paint



VCCX Components

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AAONEcat32 Ver. 4.307 (SN: 6554592-8QXGX130)

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RQ-004-3-H-EB09-11A:5000-00B-QJD-AG0-01EAH03-00-0000000VX

Tag: RTU - Mother Room

Job Name:

Shango Lapeer Grow Facility VCCX For:

Job Number:

21-0234

VCCX Date:

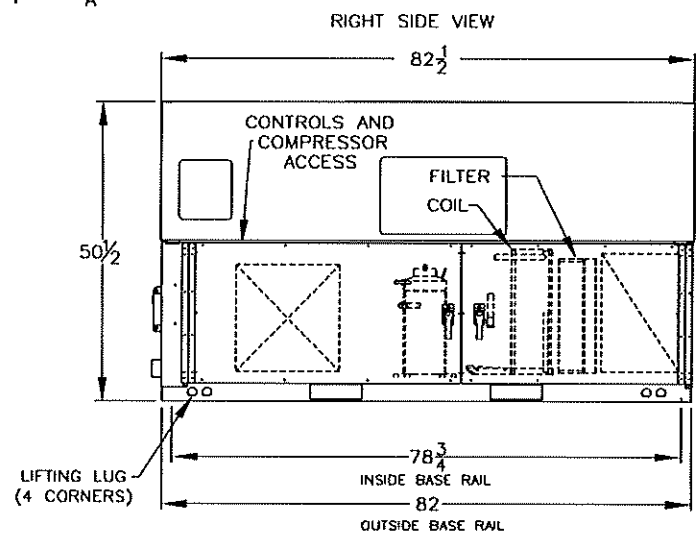
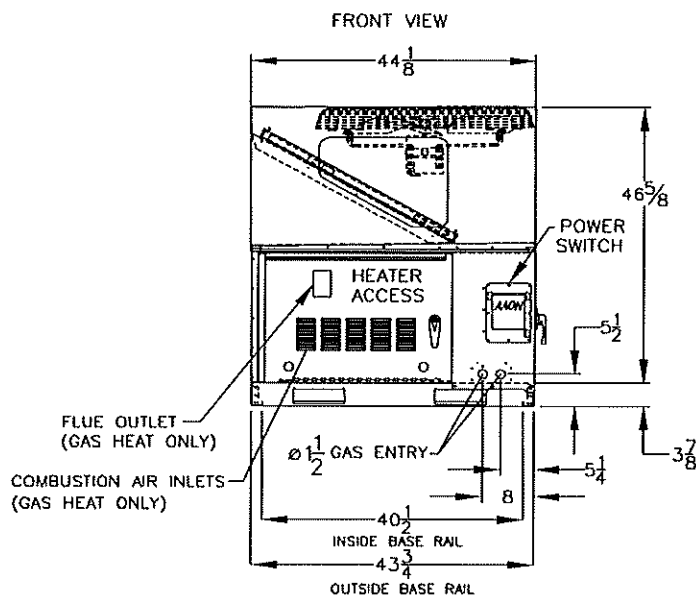
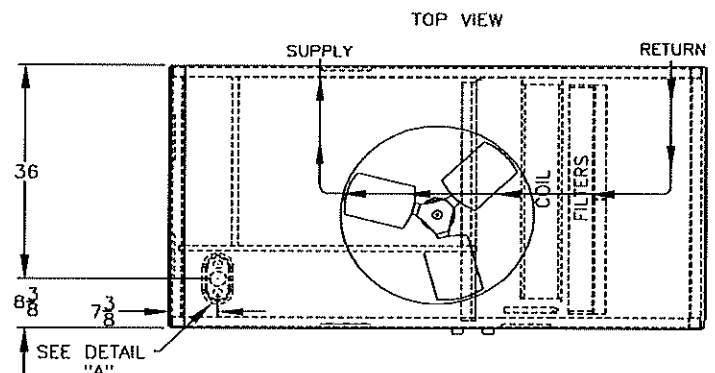
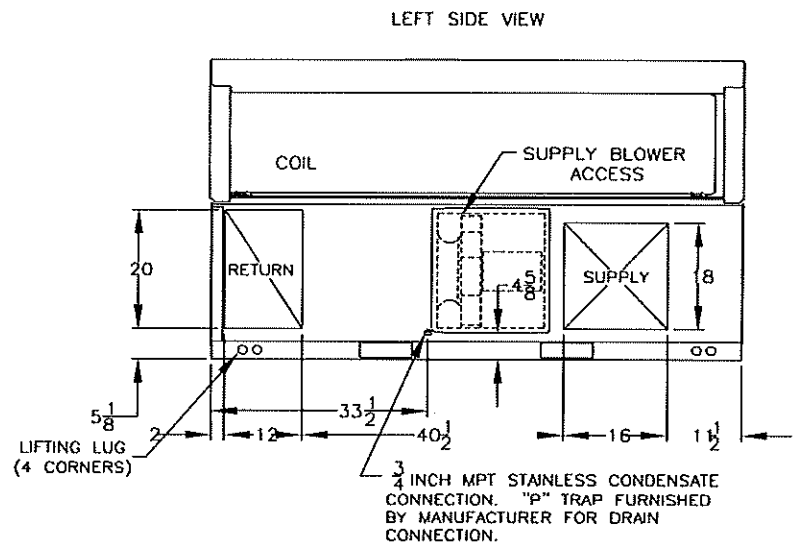
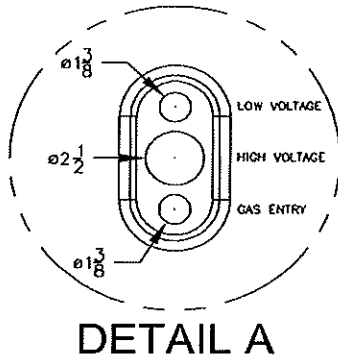
June 11, 2021

Hardware Included For VCCX Controller

Part #	Included Parts	Assigned Channel	BACnet Point
ASM01698	VCCX2 CONTROLLER		
ASM01820	Space Digital Temp/Hum Sensor	EBUS3 communicating sensor	AI:12, AI:13
R82890	Supply Temp Sensor - Field Installed	VCCX control point AI 3	AI:9
R81550	Outside Temp Sensor	VCCX control point AI 7	AI:16
	Supply Fan Control Signal 0-10VDC	VCCX control point AO 1	AI:22
	Modulated Heating (0-10VDC)	VCCX control point AO 3	AI:35
R62330	Proof of Air Flow	VCCX control point BI 1	BI:6, BI:24
	Safety Shut Down	VCCX control point BI 8	BI:26
	Supply Fan	Configured Relay Point	BI:47
	Heat 1	Configured Relay Point	BI:48
ASM02201	DIGITAL REFRIGERATION MODULE		
R57800	Comp Discharge Temp A	RSMD point TEMP1	AI:66
V38391	Suction Pressure Sensor A	RSMD point SP-1	AI:48
V38410	Discharge Pressure Sensor A	RSMD point HP-1	AI:50
R63950	Modulated Condenser Signal A	RSMD point AO1	AI:46
	Comp Status Input A	RSMD point BIN1	BI:77
	Emergency Shutdown	RSMD point BIN4	BI:83
	Comp Unload Signal A	RSMD point T1	AI:44
	Comp Enable A	RSMD Fixed Relay point	BI:84
ASM01670	MODULATING HOT GAS REHEAT MODULE		
	Reheat HGR Valve	MHGRV-X	AI:42

RQ CABINET STANDARD HORIZONTAL WITH 100% RETURN AIR ~ 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

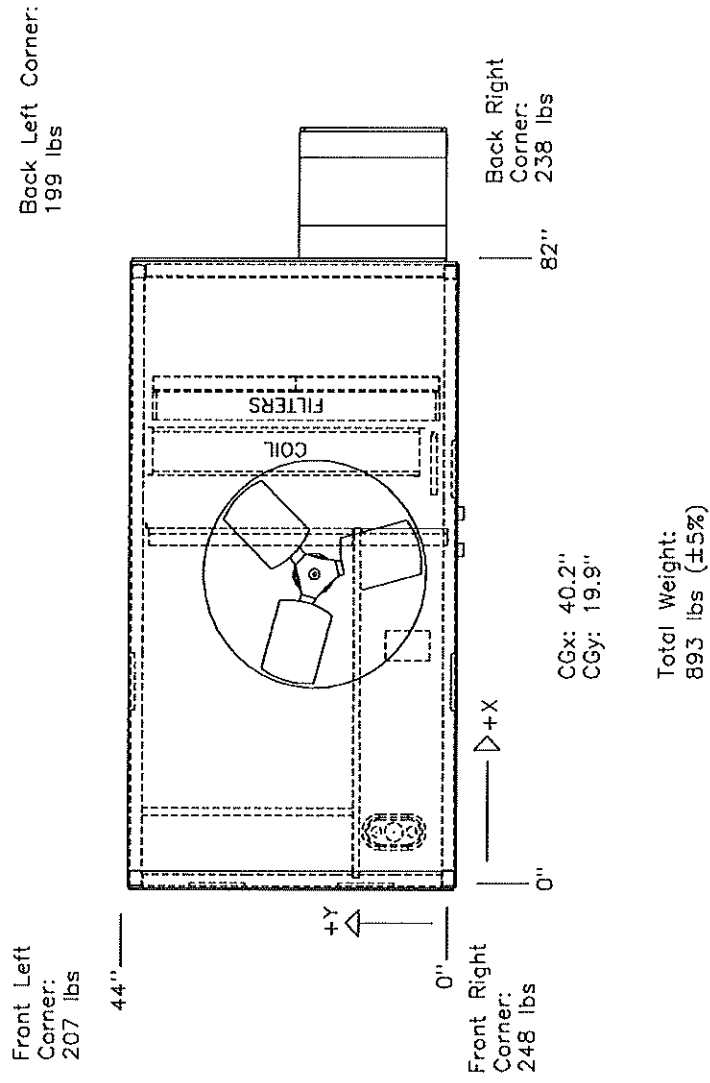


RQ CABINET

HORIZONTAL AIR COOLED CONDENSING UNIT

AAON®

RQ-004-3-H-EB09-11A:5000-00B-QJD-AG0-01EAH03-00-00000000VX



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



VEG ROOM UNITS



Unit Rating

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.307 (SN: 6654592-8QXGX130)

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RN-008-3-0-EB09-12A:5000-00B-DCF-AG0-01FAH03-00-0000000VX

Tag: RTU - Veg Room

(Values do not account for changes described in SPA)

Job Information

Job Name: Shango Lapeer Grow Facility
Job Number: 21-0234
Site Altitude: 0 ft
Refrigerant: R-410A

Static Pressure

External: 1.00 in. wg.
Evaporator: 0.81 in. wg.
Filters Clean: 0.62 in. wg.
Dirt Allowance: 0.35 in. wg.

Cooling Section

	Gross	Net
Total Capacity:	115.47	104.66 MBH
Sensible Capacity:	62.73	51.93 MBH
Latent Capacity:	52.74 MBH	
Mixed Air Temp:	78.00 °F DB	71.90 °F WB
Entering Air Temp:	78.00 °F DB	71.90 °F WB
Lv Air Temp (Coil):	64.28 °F DB	64.09 °F WB
Lv Air Temp (Unit):	66.56 °F DB	64.85 °F WB
Digital Comp. Capacity Ratio:	100%	
Supply Air Fan:	1 x RNA185 @ 3.80 BHP	
SA Fan RPM / Width:	2185 / 4.140"	
Evaporator Coil:	8.5 ft ² / 6 Rows / 14 FPI	
Evaporator Face Velocity:	505.5 fpm	

Unit Information

**WEIGHT AND PERFORMANCE DO NOT INCLUDE SPA

Approx. Op./Ship Weights: 1182 / 1182 lbs. (±5%)
Supply CFM/ESP: 4300 / 1 in. wg.
Pre-Filter FV / Qty: 483.75 fpm / 4
Final Filter FV / Qty: 483.75 fpm / 4
Ambient Temperature: 95 °F DB / 75 °F WB
Return Temperature: 78 °F DB / 71.9 °F WB

Economizer: 0.00 in. wg.
Heating: 0.21 in. wg.
Cabinet: 0.26 in. wg.
Re-Heat Coil: 0.12 in. wg.
Total: 3.35 in. wg.

Heating Section

PreHeat Type: Std (No Preheat)
Heating Type: Electric Heat
Heating CFM: 4300
Total Capacity: 68.3 MBH
OA Temp: 0.0 °F DB / 0.0 °F WB
RA Temp: 78.0 °F DB / 71.9 °F WB
Entering Air Temp: 78.0 °F DB / 71.9 °F WB
Leaving Air Temp: 92.7 °F DB / 75.9 °F WB
Input: 20.0 kW
Heater Qty: 2
Electric Heat FLA: 24.1

Re-Heat Coil:

Capacity: 64 MBH
LA DB / WB: 78.00 °F / 68.50 °F
RH: 62%

Rating Information

Cooling Capacity (MBH): 96.0
Cooling EER: 11.9
Cooling IEER: 13.9
Rated in accordance with AHRI 340/360

Application EER @ Op. Conditions: 9.4

4300	Supply Air CFM
78.0°FDB @ 75% RH	Indoor Design Conditions
108.6	Indoor Design GR/LB
78.0/68.5	AHU LAT °FDB/°FWB
89.6	AHU LAT GR/LB
52.52	LBS/HR Moisture Removal Capacity at 78.0°FDB @ 75% RH Room Design Conditions

Electrical Data

Rating: 460/3/60
Unit FLA: ~~32~~ 46
SCCR: 5 KAIC

Minimum Circuit Amp: ~~40~~ 55
Maximum Overcurrent: ~~40~~ 60

	Qty	HP	VAC	Phase	RPM	FLA	RLA
Compressor 1:	1		460	3			12.6
Condenser Fans:	1	0.75	460	3	1080	1.8	
Supply Fan:	1	5.00	460	3	1760	7.6	

Cabinet Sound Power Levels*

Octave Bands:	63	125	250	500	1000	2000	4000	8000
Discharge LW(dB):	90	90	92	89	83	79	76	72
Return LW(dB):	80	81	79	73	70	63	52	41

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



18.5" STAR Plenum

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AAONEcat32 Ver. 4.307 (SN: 6554592-8QXGX130)

JOB INFORMATION:

Job Name: *Shango Lapeer Grow Facility*
Job Tag: *RTU - Veg Room*
Rep Firm: *Jerome FitzGerald*
Date: *06/11/2021*

WHEEL SPECIFICATION:

Max RPM: *2,200*
Diameter x Qty: *18.5 in. x 1*
CFM: *4300*
Tip Speed: *10,583 FPM*
Inertia: *3 WR²*

OPERATING CONDITIONS:

Air Flow: *4,300 CFM*
Static Pressure: *3.35 in. Wg.*
Relief Dampers DP: *0.00 in. Wg.*

TSP: *3.35 in. Wg.*
Site Altitude: *0.00 Ft*
TSP @ Sea Level: *3.35 in. Wg.*

MOTOR SELECTION:

Rated HP / Bypass: *5 / No*
Frame Size: *184T*
Nominal RPM: *1760*
VAC/PH/Hz: *460/3/60*
Efficiency: *Premium / 0.895*
Enclosure Type: *ODP*
Max Inertial Load: *52 WR²*

FAN PERFORMANCE:

RPM: *2185*
BHP: *3.80*
Efficiency: *59.7%*
In/Out Velocity: *2457/2575 FPM*
Plenum Out Velocity: *72 FPM*

FAN SOUND POWER (Inlet/Outlet):

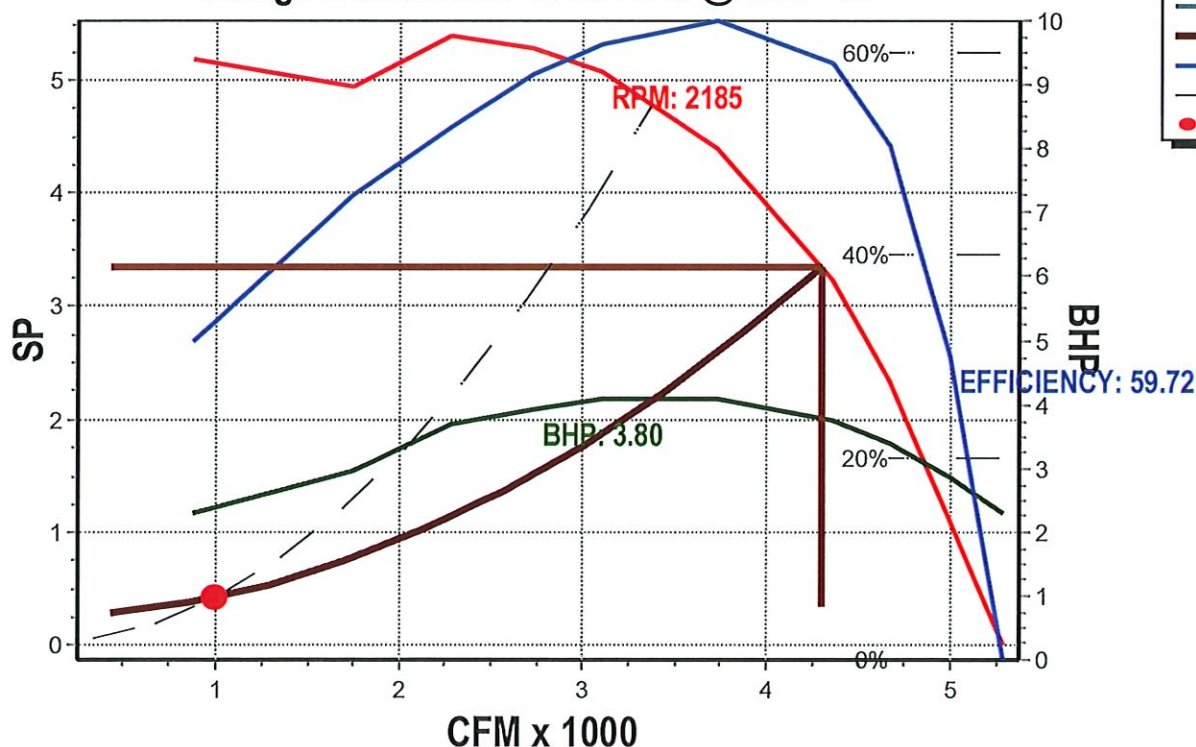
Octave Band: (Re 10⁻¹² watts)

1	2	3	4	5	6	7	8
90	90	92	91	86	83	80	76
90	90	92	91	86	83	80	76

SOUND POWER A-Weighted: *92 / 92 dB*

Max Duct SP with Blocked Airway: *5.4 in. Wg. @ 2185 rpm*

Supply Fan Model: RNA185 @ 2185 RPM and 100% Width
Design Conditions: 4300 CFM @ 3.35" SP





Unit Submittal

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Tag: RTU - Veg Room

Job Name:
Job Number:

Shango Lapeer Grow Facility
21-0234

Unit Submittal For:
Unit Submittal Date:

June 11, 2021

	Base Option	Description
R	Series	Roof Top Unit
N	Generation	Ninth Generation
008	Unit Size	Eight
3	Voltage	460V/3Ø/60Hz
0	Interior Protection	Standard
E	Refrigerant Style	R-410A VCC - High Efficiency
B	Unit Configuration	Air-Cooled Cond. + 6 Row Evap. Coil
0	Coil Coating	Standard
9	Cooling/Heat Pump Staging	Modulating - 1 Variable Capacity Compressor
1	Heating Type	Electric Heat
2	Heating Designation	Heat 2 - 20 kW
A	Heating Staging	Modulating/SCR Electric - 0-10V Control Signal

	Feature Option	Description
5	1A. RA/OA Section	100% Return Air (No O/A Opening)
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	Standard - None
0	3. Heat Options	Standard
B	4. Maintenance Options	115V Convenience Outlet - Factory Wired
D	5A. SA Blower Configuration	1 Blower + Premium Efficiency Motor + 1 VFD
C	5B. SA Blower	18.5" Direct Drive Backward Curved Plenum
F	5C. SA Motor	5.0 hp - 1760 rpm
A	6A. Pre Filter Type	2" Pleated Pre Filter - 30% Eff
G	6B. Unit Filter Type	4" Pleated - 85% Eff - MERV 13
0	6C. Filter Options	Standard
0	7. Refrigeration Control	Standard - Adj Comp. Cooling Lock Out Through Unit Controls
1	8. Refrigeration Options	Parallel Modulating Hot Gas Reheat Microchannel Coil [MHGR-MC] - Single Circuit
F	9. Refrigeration Accessories	VFD Condenser Fan - Head Pressure Control
A	10. Power Options	Non-fused Disconnect Power Switch - 100 Amps
H	11. Safety Options	Remote Safety Shutdown Terminals
0	12. Controls	Standard
3	13. Special Controls	VAV Single Zone Unit Controller - VAV Cool + VAV Heat
0	14A. Outside Air 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. Electrical Rating	Standard - 5 KAIC
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	VCC-X Controls + Integrated BACnet MSTP
X	23. Type	Special Price Authorization + AAON Gray Paint



VCCX Components

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AAONEcat32 Ver. 4.307 (SN: 6554692-8QXGX130)

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

RN-008-3-0-EB09-12A:5000-00B-DCF-AG0-01FAH03-00-0000000VX

Tag: RTU - Veg Room

Job Name:

Shango Lapeer Grow Facility VCCX For:

Job Number:

21-0234

VCCX Date:

June 11, 2021

Hardware Included For VCCX Controller

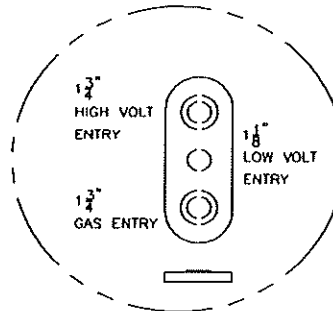
Part #	Included Parts	Assigned Channel	BACnet Point
ASM01698	VCCX2 CONTROLLER		
ASM01820	Space Digital Temp/Hum Sensor	EBUS3 communicating sensor	AI:12, AI:13
R82890	Supply Temp Sensor - Field Installed	VCCX control point AI 3	AI:9
R81550	Outside Temp Sensor	VCCX control point AI 7	AI:16
	Supply Fan Control Signal 0-10VDC	VCCX control point AO 1	AI:22
	Modulated Heating (0-10VDC)	VCCX control point AO 3	AI:35
R62330	Proof of Air Flow	VCCX control point BI 1	BI:6, BI:24
	Safety Shut Down	VCCX control point BI 8	BI:26
	Supply Fan	Configured Relay Point	BI:47
	Heat 1	Configured Relay Point	BI:48
ASM02201	DIGITAL REFRIGERATION MODULE		
R42680	Comp Discharge Temp A	RSMD point TEMP1	AI:66
V38391	Suction Pressure Sensor A	RSMD point SP-1	AI:48
V38410	Discharge Pressure Sensor A	RSMD point HP-1	AI:50
	Modulated Condenser Signal A	RSMD point AO1	AI:46
	Comp Status Input A	RSMD point BIN1	BI:77
	Emergency Shutdown	RSMD point BIN4	BI:83
	Comp Unload Signal A	RSMD point T1	AI:44
	Comp Enable A	RSMD Fixed Relay point	BI:84
ASM01670	MODULATING HOT GAS REHEAT MODULE		
	Reheat HGR Valve	MHGRV-X	AI:42

RN SERIES

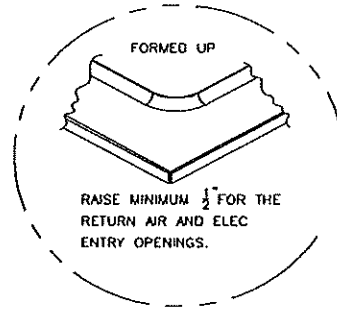
A - CABINET STANDARD WITH 100% RETURN AIR ~ 6-10 TON

CLEARANCES	
LOCATION	• UNIT SIZE • 6 - 10 TON
OUTSIDE AIR (BACK)	36
CONTROLS SIDE (FRONT)	48
LEFT SIDE	6
RIGHT SIDE	48
TOP	UNOBSTRUCTED

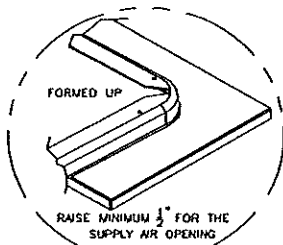
NOTE: THE RNA UNIT IS NOT COMPATIBLE WITH PREVIOUS GENERATIONS OF AAON CURBS. AN ADAPTER CURB IS AVAILABLE IN ECAT.



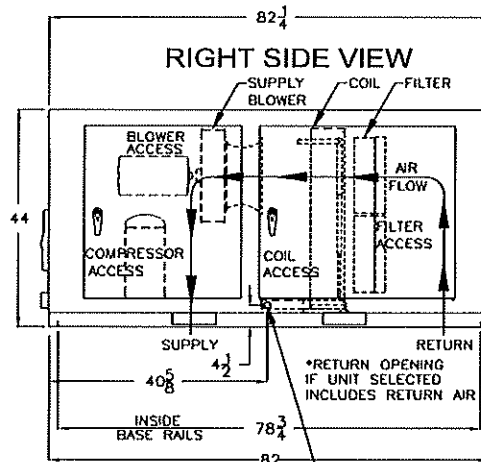
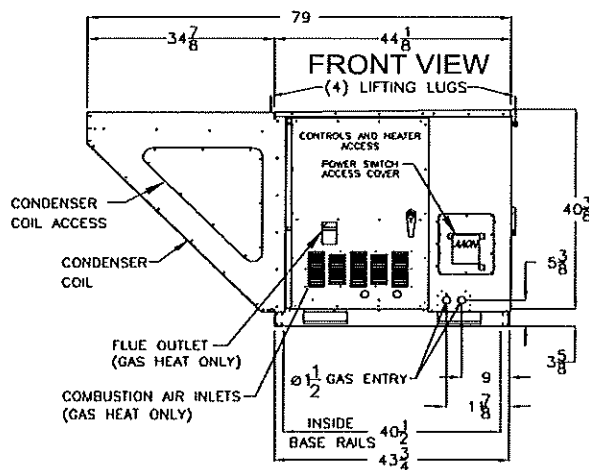
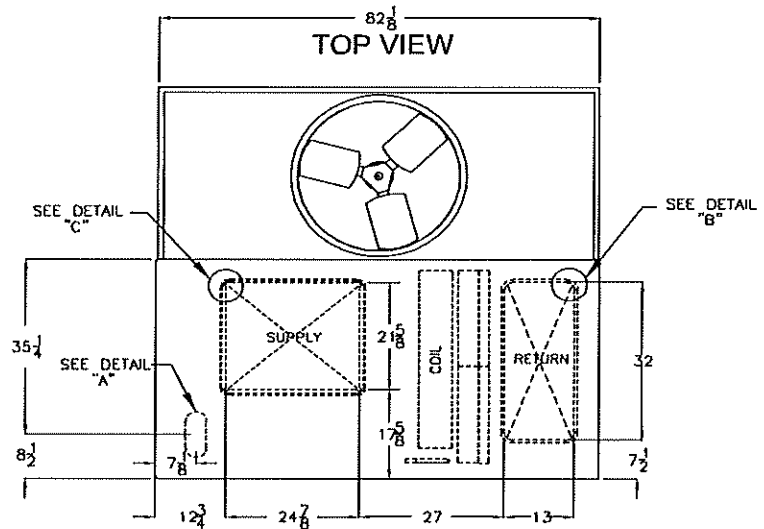
DETAIL A



DETAIL B



DETAIL C

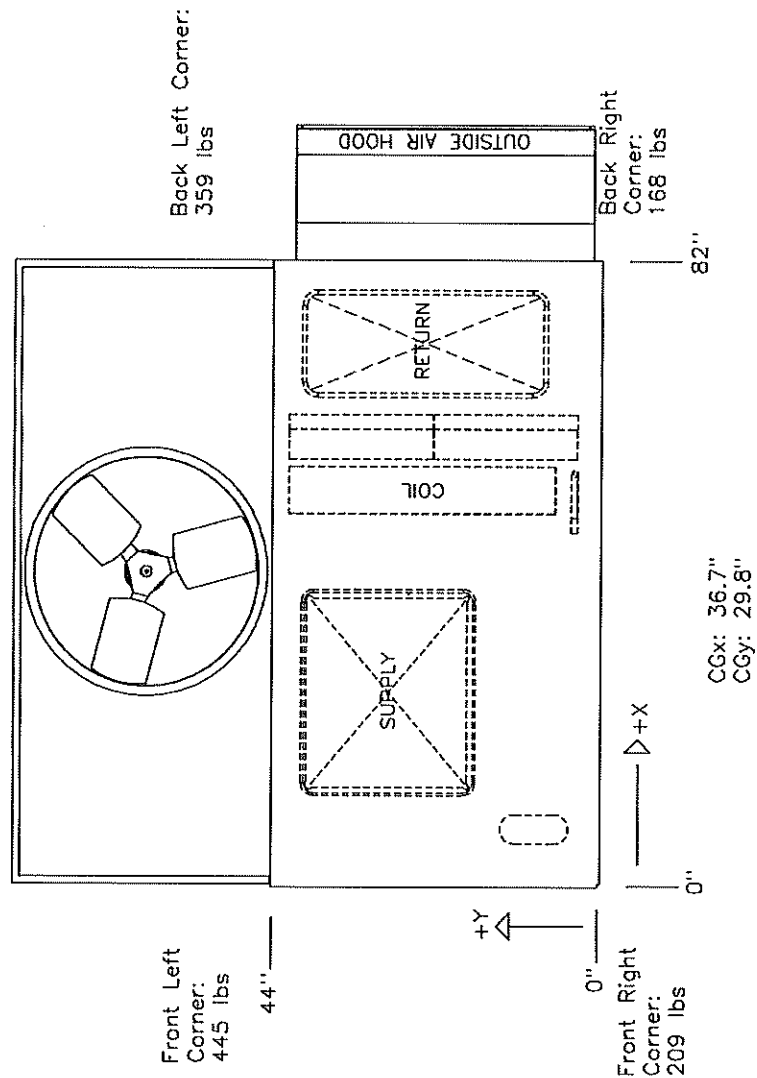


1" MPT STAINLESS CONDENSATE CONNECTION. "P" TRAP FURNISHED BY MANUFACTURER FOR DRAIN CONNECTION.

RNA CABINET AIR COOLED CONDENSING UNIT



RN-008-3-0-EB09-12A:5000-00B-DCF-AG0-01FAH03-00-00000000VX



Total Weight:
1182 lbs (±5%)

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



FLOWER ROOM UNITS



Unit Rating

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEnt32 Ver. 4.307 (SN: 6554592-8QXGX130)

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

RN-030-3-0-EB09-16A:5000-00B-DDL-AG0-02FBH0D-00-0000000VX

Tag: RTU - Flower Rooms 72.0/59.9

(Values do not account for changes described in SPA)

Job Information

Job Name: Shango Lapeer Grow Facility
Job Number: 21-0234
Site Altitude: 0 ft
Refrigerant: R-410A

Unit Information

**WEIGHT AND PERFORMANCE DO NOT INCLUDE SPA

Approx. Op./Ship Weights: 2732 / 2732 lbs. (±5%)
Supply CFM/ESP: 7200 / 0.75 in. wg.
Pre-Filter FV / Qty: 345.60 fpm / 6
Final Filter FV / Qty: 345.60 fpm / 6
Ambient Temperature: 95 °F DB / 75 °F WB
Return Temperature: 72 °F DB / 59.9 °F WB

Economizer: 0.00 in. wg.
Heating: 0.20 in. wg.
Cabinet: 0.11 in. wg.
Re-Heat Coil: 0.06 in. wg.
Total: 2.31 in. wg.

Static Pressure

External: 0.75 in. wg.
Evaporator: 0.47 in. wg.
Filters Clean: 0.36 in. wg.
Dirt Allowance: 0.35 in. wg.

Heating Section

PreHeat Type: Std (No Preheat)
Heating Type: Electric Heat
Heating CFM: 7200
Total Capacity: 204.8 MBH
OA Temp: 0.0 °F DB / 0.0 °F WB
RA Temp: 72.0 °F DB / 59.9 °F WB
Entering Air Temp: 72.0 °F DB / 59.9 °F WB
Leaving Air Temp: 98.3 °F DB / 68.7 °F WB
Input: 60.0 kW
Heater Qty: 6
Electric Heat FLA: 72.2

Re-Heat Coil:

Capacity: 218 MBH
LA DB / WB: 72.00 °F / 55.96 °F
RH: 35%

Cooling Section

	Gross	Net
Total Capacity:	296.25	283.64 MBH
Sensible Capacity:	216.75	204.15 MBH
Latent Capacity:	79.50 MBH	
Mixed Air Temp:	72.00 °F DB	59.90 °F WB
Entering Air Temp:	72.00 °F DB	59.90 °F WB
Lv Air Temp (Coil):	43.96 °F DB	43.56 °F WB
Lv Air Temp (Unit)	45.56 °F DB	44.35 °F WB
Digital Comp. Capacity Ratio:	100%	
Supply Air Fan:	1 x 245 @ 4.61 BHP	
SA Fan RPM / Width:	1357 / 5.560"	
Evaporator Coil:	19.9 ft² / 6 Rows / 12 FPI	
Evaporator Face Velocity:	362.5 fpm	

Rating Information

Cooling Capacity (MBH): 322.0
Cooling EER: 11
Cooling IEER: 12
Rated in accordance with AHRI 340/360

Application EER @ Op. Conditions: 9.3

7200	Supply Air CFM
72.0°FDB @ 50% RH	Indoor Design Conditions
57.8	Indoor Design GR/LB
72.0/55.96	AHU LAT °FDB/°FWB
41.3	AH+U LAT GR/LB
76.37	LBS/HR Moisture Removal Capacity at 72.0°FDB @ 50% RH Room Design Conditions

Electrical Data

Rating: 460/3/60
Unit FLA: ~~99~~ 145
SCCR: 5 KAIC

Minimum Circuit Amp: ~~98~~ 151
Maximum Overcurrent: ~~140~~ 175

	Qty	HP	VAC	Phase	RPM	FLA	RLA
Compressor 1:	1		460	3			23.1
Compressor 2:	1		460	3			23.1
Condenser Fans:	3	0.75	460	3	1080	1.8	
Supply Fan:	1	15.00	460	3	1760	21.0	

Cabinet Sound Power Levels*

Octave Bands:	63	125	250	500	1000	2000	4000	8000
Discharge LW(dB):	89	87	90	92	89	85	80	76
Return LW(dB):	77	75	73	67	69	62	50	41

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



24.5" STAR Plenum

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.307 (SN: 6554592-8QXGX130)

JOB INFORMATION:

Job Name: Shango Lapeer Grow Facility
Job Tag: RTU - Flower Rooms
Rep Firm: 72.059.9
Date: Jerome Fitzgerald
06/11/2021

WHEEL SPECIFICATION:

Max RPM: 2,000
Diameter x Qty: 24.5 in. x 1
Width%:
Tip Speed: 100
Inertia: 8,704 FPM
10 WR²

OPERATING CONDITIONS:

Air Flow: 7,200 CFM
Static Pressure: 2.31 in. Wg.
Plenum DP: 0.00 in. Wg.
Inlet Grill DP: 0.00 in. Wg.
TSP: 2.31 in. Wg.
Site Altitude: 0.00 Ft
TSP @ Sea Level: 2.31 in. Wg.

MOTOR SELECTION:

Rated HP / Bypass: 15 / No
Frame Size: 254T
Nominal RPM: 1760
VAC/PH/Hz: 460/3/60
Efficiency: Premium / 0.93
Enclosure Type: ODP
Max Inertial Load: 149 WR²

FAN PERFORMANCE:

RPM: 1357
BHP: 4.61
Efficiency: 56.9%
In/Out Velocity: 2202/2424 FPM
Plenum Out Velocity: 120 FPM

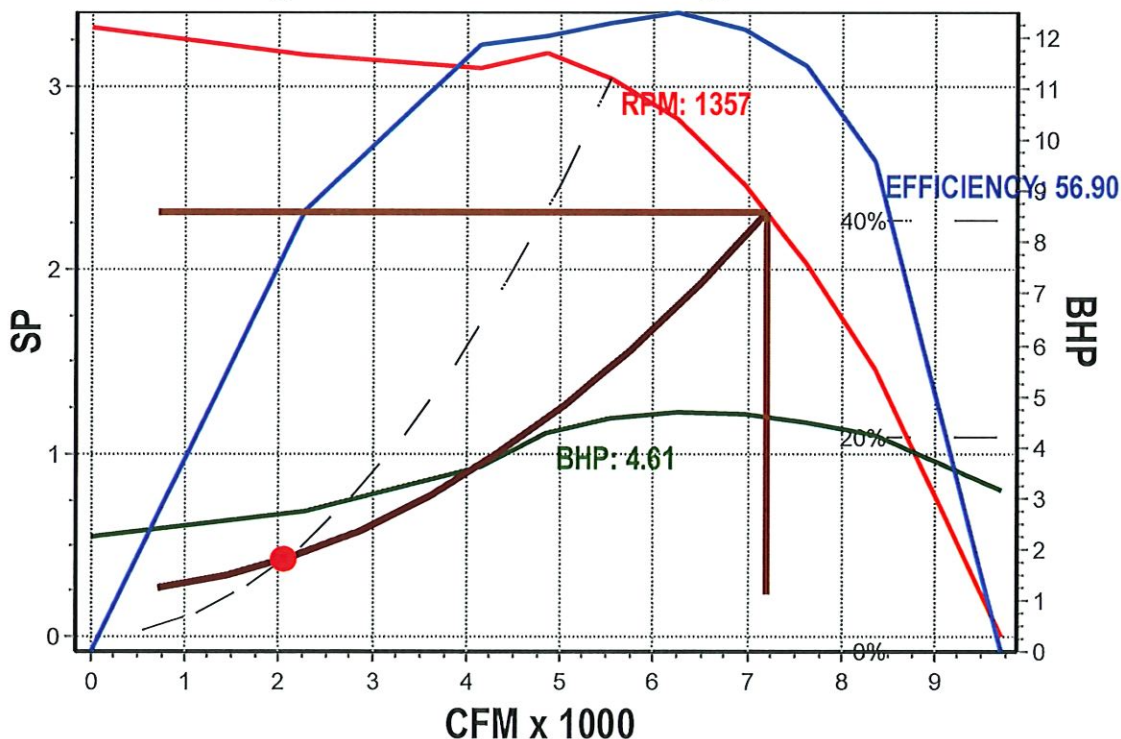
FAN SOUND POWER (Inlet/Outlet):

Octave Band:				(Re 10 ⁻¹² watts)			
1	2	3	4	5	6	7	8
87	86	85	84	84	82	80	78
89	87	90	94	92	88	84	80

SOUND POWER A-Weighted: 90 / 95 dB

Max Duct SP with Blocked Airway: 3.2 in. Wg. @ 1357 rpm

Supply Fan Model: 245 @ 1357 RPM and 100% Width
Design Conditions: 7200 CFM @ 2.31" SP





Unit Rating

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.307 (SN: 6554592-8QXG130)

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

RN-030-3-0-EB09-16A:5000-00B-DDL-AG0-02FBH0D-00-0000000VX

Tag: RTU - Flower Rooms 82.5/76.6

(Values do not account for changes described in SPA)

Job Information

Job Name: Shango Lapeer Grow Facility
Job Number: 21-0234
Site Altitude: 0 ft
Refrigerant: R-410A

Static Pressure

External: 1.25 in. wg.
Evaporator: 0.92 in. wg.
Filters Clean: 0.71 in. wg.
Dirt Allowance: 0.35 in. wg.

Cooling Section

	Gross	Net
Total Capacity:	421.86	386.54 MBH
Sensible Capacity:	186.89	151.57 MBH
Latent Capacity:	234.96 MBH	
Mixed Air Temp:	82.50 °F DB	76.60 °F WB
Entering Air Temp:	82.50 °F DB	76.60 °F WB
Lv Air Temp (Coil):	66.36 °F DB	66.09 °F WB
Lv Air Temp (Unit):	69.28 °F DB	67.02 °F WB
Digital Comp. Capacity Ratio:	100%	
Supply Air Fan:	1 x 245 @ 12.91 BHP	
SA Fan RPM / Width:	1934 / 5.560"	
Evaporator Coil:	19.9 ft ² / 6 Rows / 12 FPI	
Evaporator Face Velocity:	553.8 fpm	

Rating Information

Cooling Capacity (MBH): 322.0
Cooling EER: 11
Cooling IEER: 12
Rated in accordance with AHRI 340/360

Application EER @ Op. Conditions: 9.7

Electrical Data

Rating: 460/3/60

	Qty	HP	VAC	Phase	RPM	FLA	RLA
Compressor 1:	1		460	3			23.1
Compressor 2:	1		460	3			23.1
Condenser Fans:	3	0.75	460	3	1080	1.8	
Supply Fan:	1	15.00	460	3	1760	21.0	

Cabinet Sound Power Levels*

Octave Bands:	63	125	250	500	1000	2000	4000	8000
Discharge LW(dB):	97	95	95	101	98	94	89	85
Return LW(dB):	84	84	81	75	76	71	58	50

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

Unit Information

**WEIGHT AND PERFORMANCE DO NOT INCLUDE SPA

Approx. Op./Ship Weights: 2732 / 2732 lbs. (±5%)
Supply CFM/ESP: 11000 / 1.25 in. wg.
Pre-Filter FV / Qty: 528.00 fpm / 6
Final Filter FV / Qty: 528.00 fpm / 6
Ambient Temperature: 95 °F DB / 75 °F WB
Return Temperature: 82.5 °F DB / 76.6 °F WB

Economizer: 0.00 in. wg.
Heating: 0.35 in. wg.
Cabinet: 0.26 in. wg.
Re-Heat Coil: 0.14 in. wg.
Total: 3.99 in. wg.

Heating Section

PreHeat Type: Std (No Preheat)
Heating Type: Electric Heat
Heating CFM: 11000
Total Capacity: 204.8 MBH
OA Temp: 0.0 °F DB / 0.0 °F WB
RA Temp: 82.5 °F DB / 76.6 °F WB
Entering Air Temp: 82.5 °F DB / 76.6 °F WB
Leaving Air Temp: 99.7 °F DB / 80.8 °F WB
Input: 60.0 kW
Heater Qty: 6
Electric Heat FLA: 72.2

Re-Heat Coil:

Capacity: 192 MBH
LA DB / WB: 82.50 °F / 71.03 °F
RH: 57%



24.5" STAR Plenum

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONCat32 Ver. 4.307 (SN: 6554592-8QXGX130)

JOB INFORMATION:

Job Name: Shango Lapeer Grow Facility
Job Tag: RTU - Flower Rooms
Rep Firm: 82.5/76.6
Date: Jerome FitzGerald
06/11/2021

WHEEL SPECIFICATION:

Max RPM: 2,000
Diameter x Qty: 24.5 in. x 1
Width%:
Tip Speed: 100
Inertia: 12,405 FPM
10 WR²

OPERATING CONDITIONS:

Air Flow: 11,000 CFM
Static Pressure: 3.99 in. Wg.
Plenum DP: 0.00 in. Wg.
Inlet Grill DP: 0.00 in. Wg.
TSP: 3.99 in. Wg.
Site Altitude: 0.00 Ft
TSP @ Sea Level: 3.99 in. Wg.

MOTOR SELECTION:

Rated HP / Bypass: 15 / No
Frame Size: 254T
Nominal RPM: 1760
VAC/PH/Hz: 460/3/60
Efficiency: Premium / 0.93
Enclosure Type: ODP
Max Inertial Load: 149 WR²

FAN PERFORMANCE:

RPM: 1934
BHP: 12.91
Efficiency: 53.6%
In/Out Velocity: 3364/3704 FPM
Plenum Out Velocity: 183 FPM

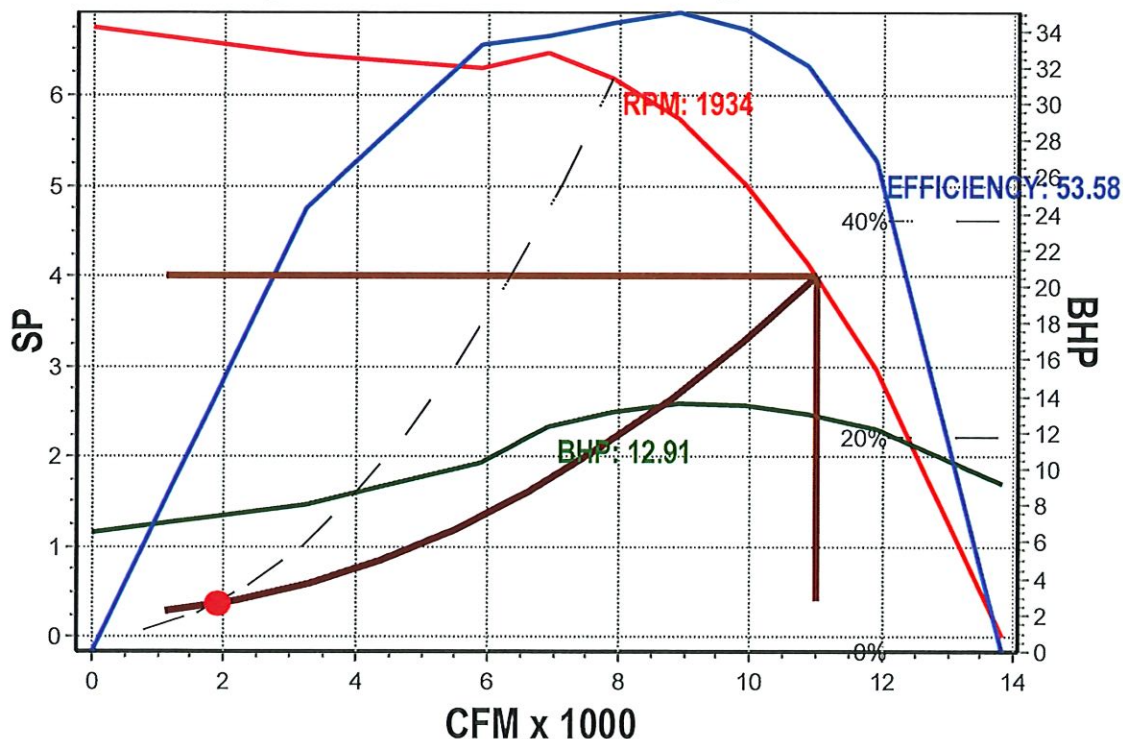
FAN SOUND POWER (Inlet/Outlet):

Octave Band:		(Re 10 ⁻¹² watts)							
1	2	3	4	5	6	7	8		
94	94	93	91	91	91	88	87		
97	95	95	102	101	97	93	89		

SOUND POWER A-Weighted: 98 / 104 dB

Max Duct SP with Blocked Airway: 6.5 in. Wg. @ 1934 rpm

Supply Fan Model: 245 @ 1934 RPM and 100% Width
Design Conditions: 11000 CFM @ 3.99" SP





Unit Submittal

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.307 (SN: 6554592-8QXGX130)

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

RN-030-3-0-EB09-16A:5000-00B-DDL-AG0-02FBH0D-00-0000000VX
Tag: RTU - Flower Rooms 82.5/76.6

Job Name:
Job Number:

Shango Lapeer Grow Facility
21-0234

Unit Submittal For:
Unit Submittal Date:

June 11, 2021

	Base Option	Description
R	Series	Roof Top Unit
N	Generation	Ninth Generation
030	Unit Size	Thirty
3	Voltage	460V/3Ø/60Hz
0	Interior Protection	Standard
E	Refrigerant Style	R-410A Variable Capacity Scroll Compressor (VCC)
B	Unit Configuration	Air-Cooled Cond. + 6 Row Evap. Coil
0	Coil Coating	Standard
9	Cooling/Heat Pump Staging	Modulating - 1 VCC + 1 On/Off Comp.
1	Heating Type	Electric Heat
6	Heating Designation	Heat 6 - 60 kW
A	Heating Staging	Modulating/SCR Electric - 0-10V Control Signal

	Feature Option	Description
5	1A. RA/OA Section	100% Return Air (No O/A Opening)
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	Standard - None
0	3. Heat Options	Standard
B	4. Maintenance Options	115V Convenience Outlet - Factory Wired
D	5A. SA Blower Configuration	1 Blower + Premium Efficiency Motor + 1 VFD
D	5B. SA Blower	24" Direct Drive Backward Curved Plenum
L	5C. SA Motor	15 hp - 1760 rpm
A	6A. Pre Filter Type	2" Pleated Pre Filter - 30% Eff
G	6B. Unit Filter Type	4" Pleated - 85% Eff - MERV 13
0	6C. Filter Options	Standard
0	7. Refrigeration Control	Standard - Adj Comp. Cooling Lock Out Through Unit Controls
2	8. Refrigeration Options	HGB Lag + All Circuit Parallel MHGR-MC
F	9. Refrigeration Accessories	VFD Condenser Fan - Head Pressure Control
B	10. Power Options	Non-fused Disconnect Power Switch - 150 Amps
H	11. Safety Options	Remote Safety Shutdown Terminals
0	12. Controls	Standard
D	13. Special Controls	VAV Unit Controller - VAV Cool + CV Heat
0	14A. Outside Air 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. Electrical Rating	Standard - 5 KAIC
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	VCC-X Controls + Integrated BACnet MSTP
X	23. Type	Special Price Authorization + AAON Gray Paint



VCCX Components

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver: 4.307 (SN: 6554592-8QXGX130)

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

RN-030-3-0-EB09-16A:5000-00B-DDL-AG0-02FBH0D-00-0000000VX

Tag: RTU - Flower Rooms 82.5/76.6

Job Name: *Shango Lapeer Grow Facility* VCCX For:

Job Number: *21-0234* VCCX Date:

June 11, 2021

Hardware Included For VCCX Controller

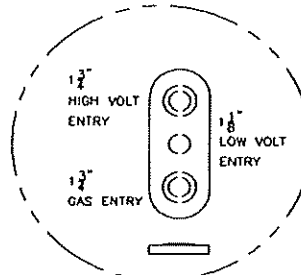
Part #	Included Parts	Assigned Channel	BACnet Point
ASM01698	VCCX2 CONTROLLER		
ASM01820	Space Digital Temp/Hum Sensor	EBUS3 communicating sensor	AI:12, AI:13
R82890	Supply Temp Sensor - Field Installed	VCCX control point AI 3	AI:9
R82890	Return Temp Sensor	VCCX control point AI 4	AI:14
R81550	Outside Temp Sensor	VCCX control point AI 7	AI:16
P87100	Duct Static Pressure Sensor	VCCX control point AI 8	AI:21
	Supply Fan Control Signal 0-10VDC	VCCX control point AO 1	AI:22
	Modulated Heating (0-10VDC)	VCCX control point AO 3	AI:35
R62330	Proof of Air Flow	VCCX control point BI 1	BI:6, BI:24
	Safety Shut Down	VCCX control point BI 8	BI:26
	Supply Fan	Configured Relay Point	BI:47
	Heat 1	Configured Relay Point	BI:48
	Heat 2	Configured Relay Point	BI:49
	Morning Warm-Up	Configured Relay Point	BI:50
ASM02201	DIGITAL REFRIGERATION MODULE		
R42680	Comp Discharge Temp A	RSMD point TEMP1	AI:66
V38391	Suction Pressure Sensor A	RSMD point SP-1	AI:48
V38410	Discharge Pressure Sensor A	RSMD point HP-1	AI:50
V38410	Discharge Pressure Sensor B	RSMD point HP-2	AI:75
	Modulated Condenser Signal AB	RSMD point AO1	AI:46
	Comp Status Input A	RSMD point BIN1	BI:77
	Comp Status Input B	RSMD point BIN2	BI:78
	Emergency Shutdown	RSMD point BIN4	BI:83
	Comp Unload Signal A	RSMD point T1	AI:44
	Comp Enable A	RSMD Fixed Relay point	BI:84
	Comp Enable B	RSMD Fixed Relay point	BI:85
ASM01670	MODULATING HOT GAS REHEAT MODULE		
	Reheat HGR Valve	MHGRV-X	AI:42

RN SERIES

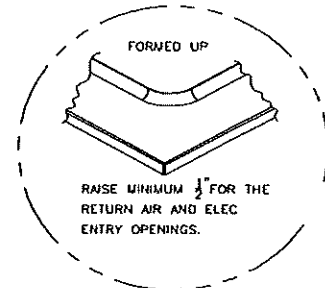
C - CABINET STANDARD WITH 100% RETURN AIR

~ 16-30 TON

CLEARANCES	
LOCATION	• UNIT SIZE • 16 - 30 TON
OUTSIDE AIR (BACK)	48
CONTROLS SIDE (FRONT)	48
LEFT SIDE	6
RIGHT SIDE	60
TOP	UNOBSTRUCTED



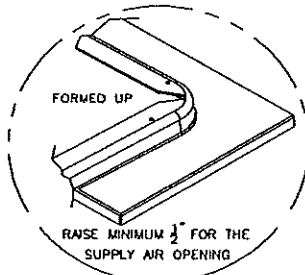
DETAIL A



DETAIL B

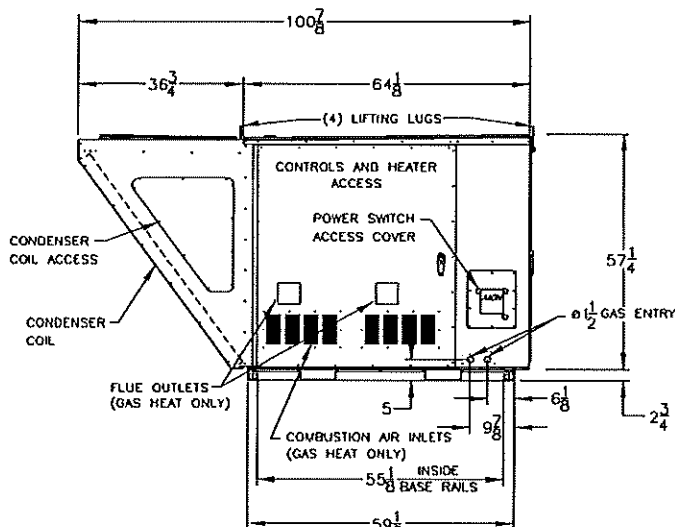
NUMBER OF CONDENSER FANS

16, 18 & 20 TON - 2 FANS
25 & 30 TON - 3 FANS



DETAIL C

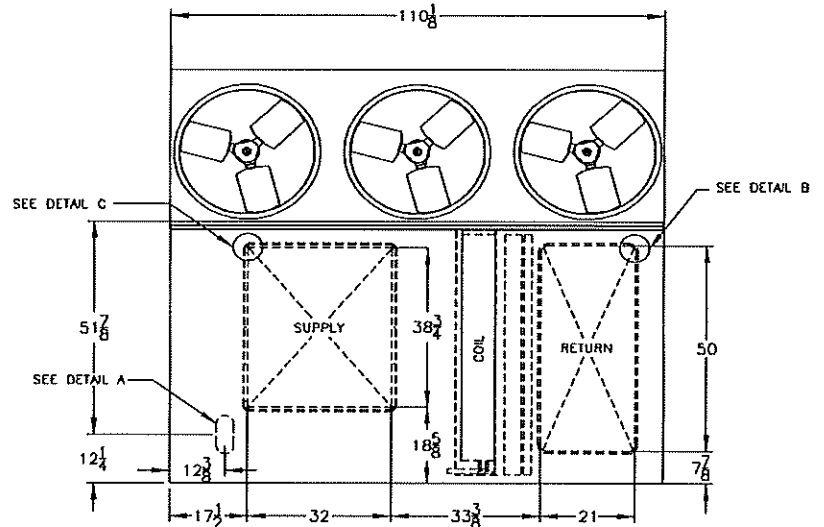
FRONT VIEW



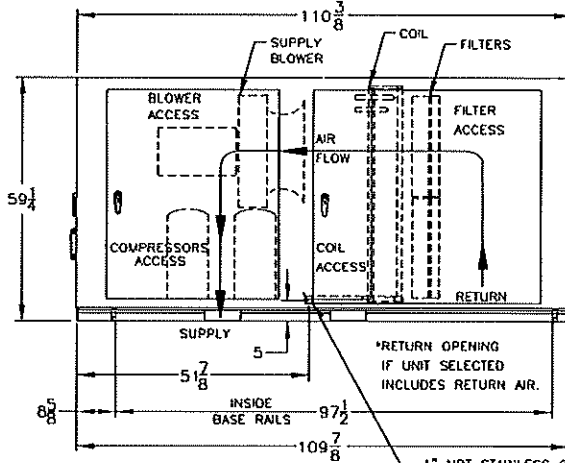
RNC-00117 NEW 12/03/10 JRL

NOTE: ALL DIMENSIONS ARE IN INCHES

TOP VIEW



RIGHT SIDE VIEW

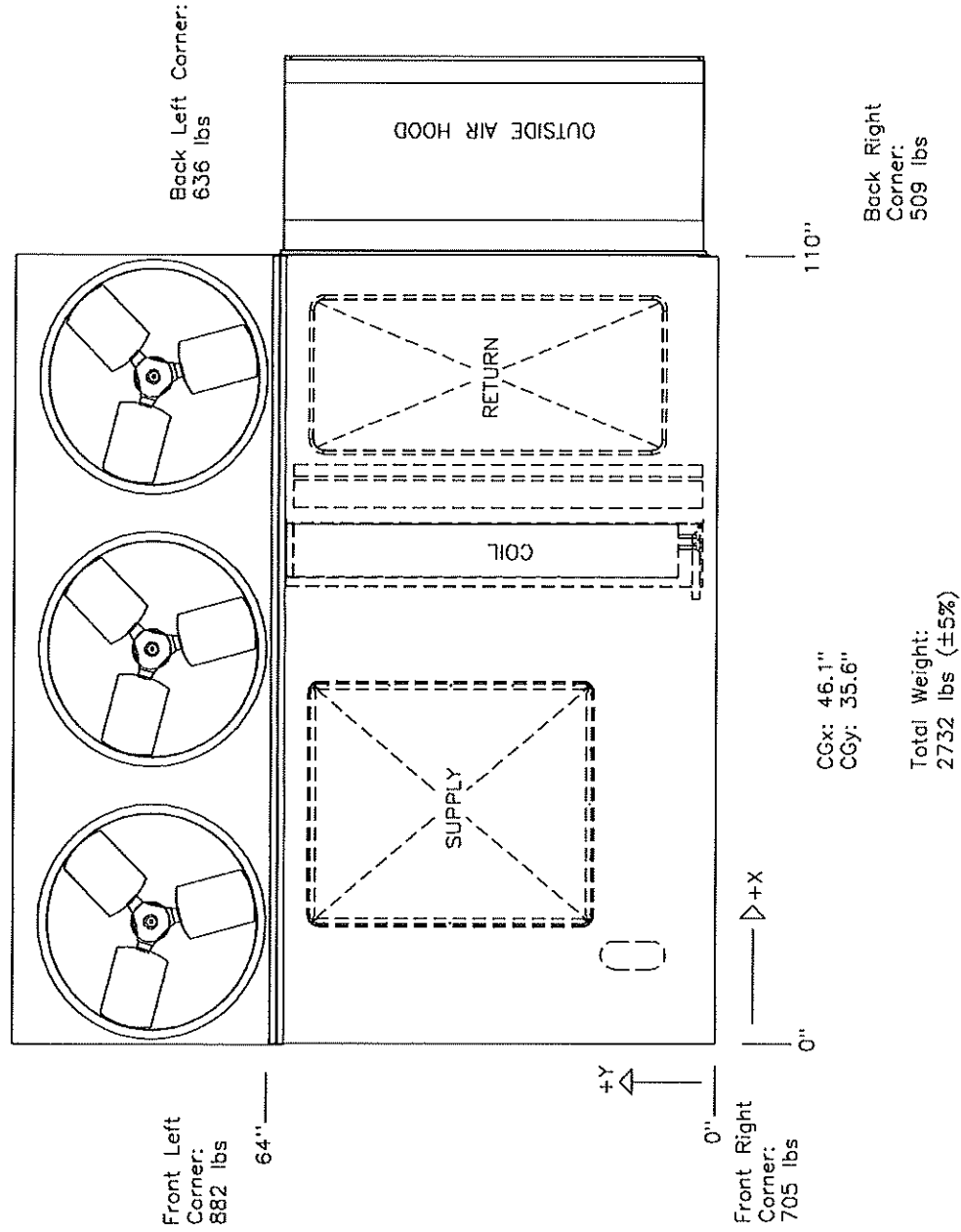


1" MPT STAINLESS CONDENSATE CONNECTION. "P" TRAP FURNISHED BY MANUFACTURER FOR DRAIN CONNECTION.

RNC CABINET AIR COOLED CONDENSING UNIT



RN-030-3-0-EB09-16A:5000-00B-DDL-AG0-02FBH0D-00-00000000VX



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



FLOWER ROOM UNITS WITH POWER EXHAUST

**PERFORMANCE SHOWN IS WITH 3000 CFM EXHAUST & OUTSIDE AIR DURING CO2
DRAWN DOWN MODE.
WHEN NOT IN CO2 DRAW DOWN MODE PERFORMANCE WILL MATCH FLOWER ROOM
UNITS WITHOUT POWER EXHAUST**



Unit Rating

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.307 (SN: 6554592-8QXGX130)

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

RN-030-3-0-EB09-17A:PELC-DOB-DDL-AGO-02FBH03-00-000000VX

Tag: RTU - Flower Rooms W/Power Exhaust 72.0/59.9

(Values do not account for changes described in SPA)

Job Information

Job Name: Shango Lapeer Grow Facility
Job Number: 21-0234
Site Altitude: 0 ft
Refrigerant: R-410A

Unit Information

**WEIGHT AND PERFORMANCE DO NOT INCLUDE SPA

Approx. Op./Ship Weights: 3370 / 3370 lbs. (±5%)
Supply CFM/ESP: 7200 / 0.75 in. wg.
Pre-Filter FV / Qty: 345.60 fpm / 6
Final Filter FV / Qty: 345.60 fpm / 6
Exhaust CFM/ESP/TSP: 3000 / 0.25 / 0.43 in. wg.
Outside CFM: 3000
Ambient Temperature: 95 °F DB / 75 °F WB
Return Temperature: 72 °F DB / 59.9 °F WB

Static Pressure

External: 0.75 in. wg.
Evaporator: 0.46 in. wg.
Filters Clean: 0.36 in. wg.
Dirt Allowance: 0.35 in. wg.

Economizer: 0.17 in. wg.
Heating: 0.20 in. wg.
Cabinet: 0.11 in. wg.
Re-Heat Coil: 0.06 in. wg.
Total: 2.47 in. wg.

Cooling Section

	Gross	Net
Total Capacity:	329.43	316.07 MBH
Sensible Capacity:	232.41	219.05 MBH
Latent Capacity:	97.02 MBH	
Mixed Air Temp:	81.58 °F DB	66.79 °F WB
Entering Air Temp:	81.58 °F DB	66.79 °F WB
Lv Air Temp (Coil):	50.97 °F DB	50.72 °F WB
Lv Air Temp (Unit):	52.67 °F DB	51.46 °F WB
Digital Comp. Capacity Ratio:	100%	
Supply Air Fan:	1 x 245 @ 4.88 BHP	
SA Fan RPM / Width:	1380 / 5.560"	
Exhaust Air Fan:	1 x RM220AB70 @ 0.55 BHP	
EA Fan RPM / Width:	1000 / 3.450"	
Evaporator Coil:	19.9 ft ² / 6 Rows / 12 FPI	
Evaporator Face Velocity:	362.5 fpm	

Heating Section

PreHeat Type: Std (No Preheat)
Heating Type: Electric Heat
Heating CFM: 7200
Total Capacity: 273.0 MBH
OA Temp: 0.0 °F DB / 0.0 °F WB
RA Temp: 72.0 °F DB / 59.9 °F WB
Entering Air Temp: 42.0 °F DB / 40.9 °F WB
Leaving Air Temp: 77.1 °F DB / 56.6 °F WB
Input: 80.0 kW
Heater Qty: 8
Electric Heat FLA: 96.2

Re-Heat Coil:

Capacity: 163 MBH
LA DB / WB: 72.00 °F / 59.18 °F
RH: 47%

Rating Information

Cooling Capacity (MBH): 322.0
Cooling EER: 11
Cooling IEER: 12
Rated in accordance with AHRI 340/360

Application EER @ Op. Conditions: 10.1

7200	Supply Air CFM
72.0°FDB @ 50% RH	Indoor Design Conditions
57.8	Indoor Design GR/LB
72.0/59.18	AHU LAT °FDB/°FWB
54.7	AHU LAT GR/LB
14.35	LBS/HR Moisture Removal Capacity at 72.0°FDB @ 50% RH Room Design Conditions

Electrical Data

Rating: 460/3/60
Unit FLA: ~~119~~ 147
SCCR: 5 KAIC

Minimum Circuit Amp: ~~125~~ 153
Maximum Overcurrent: ~~125~~ 175

	Qty	HP	VAC	Phase	RPM	FLA	RLA
Compressor 1:	1		460	3			23.1
Compressor 2:	1		460	3			23.1
Condenser Fans:	3	0.75	460	3	1080	1.8	
Supply Fan:	1	15.00	460	3	1760	21.0	
Exhaust Fan:	1	1.00	460	3	1760	2.1	

Cabinet Sound Power Levels*

Octave Bands:	63	125	250	500	1000	2000	4000	8000
Discharge LW(dB):	89	88	90	94	89	86	80	76
Return LW(dB):	82	83	78	71	71	67	62	56

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



24.5" STAR Plenum

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.307 (SN: 6554592-8QXGX130)

JOB INFORMATION:

Job Name: *Shango Lapeer Grow Facility*
Job Tag: *RTU - Flower Rooms*
Rep Firm: *WPower Exhaust 72.0/59.9*
Date: *Jerome Fitzgerald*
06/11/2021

WHEEL SPECIFICATION:

Max RPM: *2,000*
Diameter x Qty: *24.5 in. x 1*
Width%:
Tip Speed: *100*
Inertia: *8,851 FPM*
10 WR²

OPERATING CONDITIONS:

Air Flow: *7,200 CFM*
Static Pressure: *2.47 in. Wg.*
Plenum DP: *0.00 in. Wg.*
Inlet Grill DP: *0.00 in. Wg.*
TSP: *2.47 in. Wg.*
Site Altitude: *0.00 Ft*
TSP @ Sea Level: *2.47 in. Wg.*

MOTOR SELECTION:

Rated HP / Bypass: *15 / No*
Frame Size: *254T*
Nominal RPM: *1760*
VAC/PH/Hz: *460/3/60*
Efficiency: *Premium / 0.93*
Enclosure Type: *ODP*
Max Inertial Load: *149 WR²*

FAN PERFORMANCE:

RPM: *1380*
BHP: *4.88*
Efficiency: *57.4%*
In/Out Velocity: *2202/2424 FPM*
Plenum Out Velocity: *120 FPM*

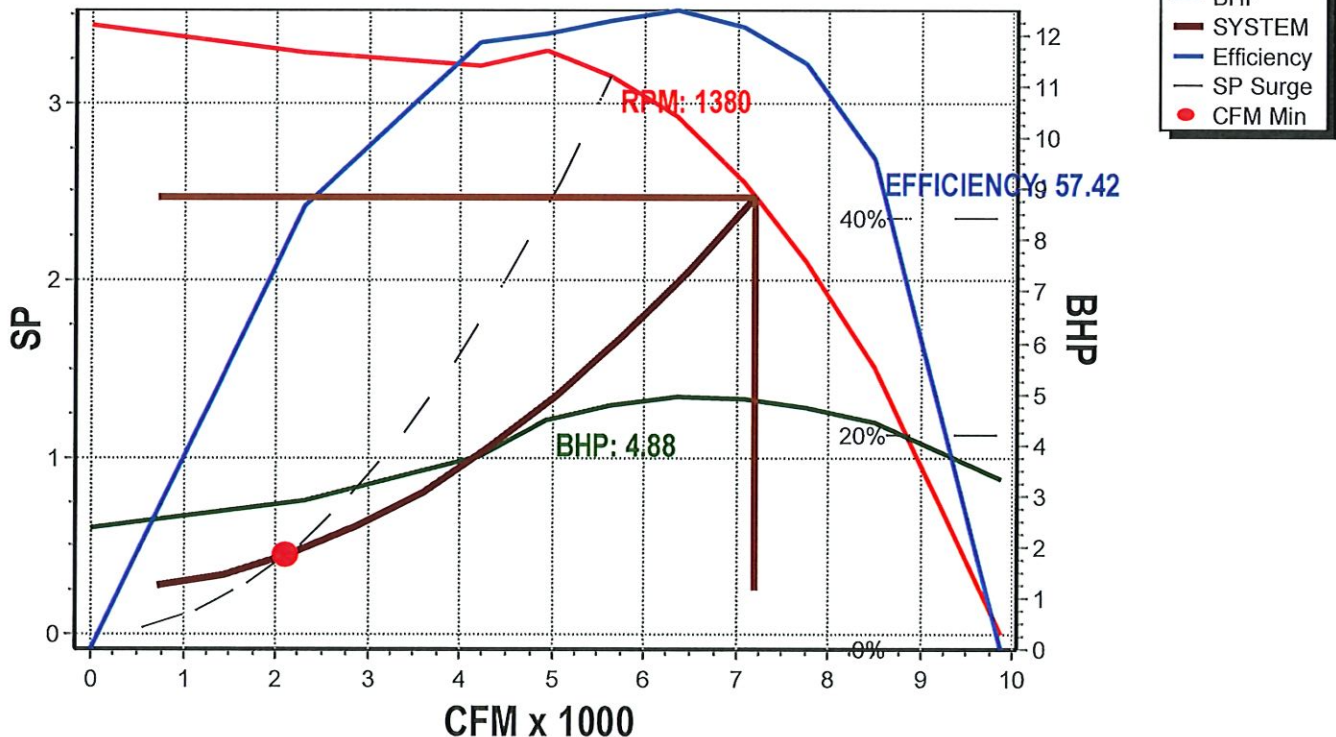
FAN SOUND POWER (Inlet/Outlet):

Octave Band:		(Re 10 ⁻¹² watts)							
1	2	3	4	5	6	7	8		
87	86	85	85	84	82	80	78		
89	87	90	95	92	89	84	80		

SOUND POWER A-Weighted: *90 / 95 dB*

Max Duct SP with Blocked Airway: *3.3 in. Wg. @ 1380 rpm*

Supply Fan Model: 245 @ 1380 RPM and 100% Width Design Conditions: 7200 CFM @ 2.47" SP





Unit Rating

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.307 (SN: 6554592-8QXGX130)

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

RN-030-3-0-EB09-16A:PELC-DOB-DDL-AG0-01FBH03-00-0000000VX

Tag: RTU - Flower Rooms W/Power Exhaust 82.5/76.6

(Values do not account for changes described in SPA)

Job Information

Job Name: Shango Lapeer Better New Design REV 6
Job Number: 21-0234
Site Altitude: 0 ft
Refrigerant: R-410A

Unit Information

**WEIGHT AND PERFORMANCE DO NOT INCLUDE SPA

Approx. Op./Ship Weights: 3370 / 3370 lbs. (±5%)
Supply CFM/ESP: 11000 / 1.25 in. wg.
Pre-Filter FV / Qty: 528.00 fpm / 6
Final Filter FV / Qty: 528.00 fpm / 6
Exhaust CFM/ESP/TSP: 3000 / 0.25 / 0.43 in. wg.
Outside CFM: 3000
Ambient Temperature: 95 °F DB / 75 °F WB
Return Temperature: 82.5 °F DB / 76.6 °F WB

Static Pressure

External: 1.25 in. wg.
Evaporator: 0.88 in. wg.
Filters Clean: 0.71 in. wg.
Dirt Allowance: 0.35 in. wg.

Economizer: 0.30 in. wg.
Heating: 0.35 in. wg.
Cabinet: 0.26 in. wg.
Re-Heat Coil: 0.14 in. wg.
Total: 4.24 in. wg.

Cooling Section

	Gross	Net
Total Capacity:	418.45	381.53 MBH
Sensible Capacity:	229.03	192.11 MBH
Latent Capacity:	189.42 MBH	
Mixed Air Temp:	85.91 °F DB	76.18 °F WB
Entering Air Temp:	85.91 °F DB	76.18 °F WB
Lv Air Temp (Coil):	66.02 °F DB	65.60 °F WB
Lv Air Temp (Unit):	69.08 °F DB	66.58 °F WB
Digital Comp. Capacity Ratio:	100%	
Supply Air Fan:	1 x 245 @ 13.49 BHP	
SA Fan RPM / Width:	1957 / 5.560"	
Exhaust Air Fan:	1 x RM220AB70 @ 0.55 BHP	
EA Fan RPM / Width:	1000 / 3.450"	
Evaporator Coil:	19.9 ft² / 6 Rows / 12 FPI	
Evaporator Face Velocity:	553.8 fpm	

Heating Section

PreHeat Type: Std (No Preheat)
Heating Type: Electric Heat
Heating CFM: 11000
Total Capacity: 204.8 MBH
OA Temp: 0.0 °F DB / 0.0 °F WB
RA Temp: 82.5 °F DB / 76.6 °F WB
Entering Air Temp: 60.0 °F DB / 60.0 °F WB
Leaving Air Temp: 77.2 °F DB / 65.9 °F WB
Input: 60.0 kW
Heater Qty: 6
Electric Heat FLA: 72.2

Re-Heat Coil:

Capacity: 509 MBH
LA DB / WB: 108.79 °F / 77.79 °F
RH: 25%

Rating Information

Cooling Capacity (MBH): 322.0
Cooling EER: 11
Cooling IEER: 12

Rated in accordance with AHRI 340/360

Application EER @ Op. Conditions: 9.5

Electrical Data

Rating: 460/3/60

	Qty	HP	VAC	Phase	RPM	FLA	RLA
Compressor 1:	1		460	3			23.1
Compressor 2:	1		460	3			23.1
Condenser Fans:	3	0.75	460	3	1080	1.8	
Supply Fan:	1	15.00	460	3	1760	21.0	
Exhaust Fan:	1	1.00	460	3	1760	2.1	

Cabinet Sound Power Levels*

Octave Bands:	63	125	250	500	1000	2000	4000	8000
Discharge LW(dB):	97	95	95	100	98	94	90	86
Return LW(dB):	86	86	83	76	78	72	63	57

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



24.5" STAR Plenum

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.307 (SN: 6554592-8QXGX130)

JOB INFORMATION:

Job Name: Shango Lapeer Better New
Job Tag: Design REV 6
Rep Firm: RTU - Flower Rooms
Date: WPower Exhaust 82.5/76.6
Jerome FitzGerald
06/11/2021

WHEEL SPECIFICATION:

Max RPM: 2,000
Diameter x Qty: 24.5 in. x 1
Width%: 24.5 in. x 1
Tip Speed: 100
Inertia: 12,552 FPM
10 WR²

OPERATING CONDITIONS:

Air Flow: 11,000 CFM
Static Pressure: 4.24 in. Wg.
Plenum DP: 0.00 in. Wg.
Inlet Grill DP: 0.00 in. Wg.
TSP: 4.24 in. Wg.
Site Altitude: 0.00 Ft
TSP @ Sea Level: 4.24 in. Wg.

MOTOR SELECTION:

Rated HP / Bypass: 15 / No
Frame Size: 254T
Nominal RPM: 1760
VAC/PH/Hz: 460/3/60
Efficiency: Premium / 0.93
Enclosure Type: ODP
Max Inertial Load: 149 WR²

FAN PERFORMANCE:

RPM: 1957
BHP: 13.49
Efficiency: 54.5%
In/Out Velocity: 3364/3704 FPM
Plenum Out Velocity: 183 FPM

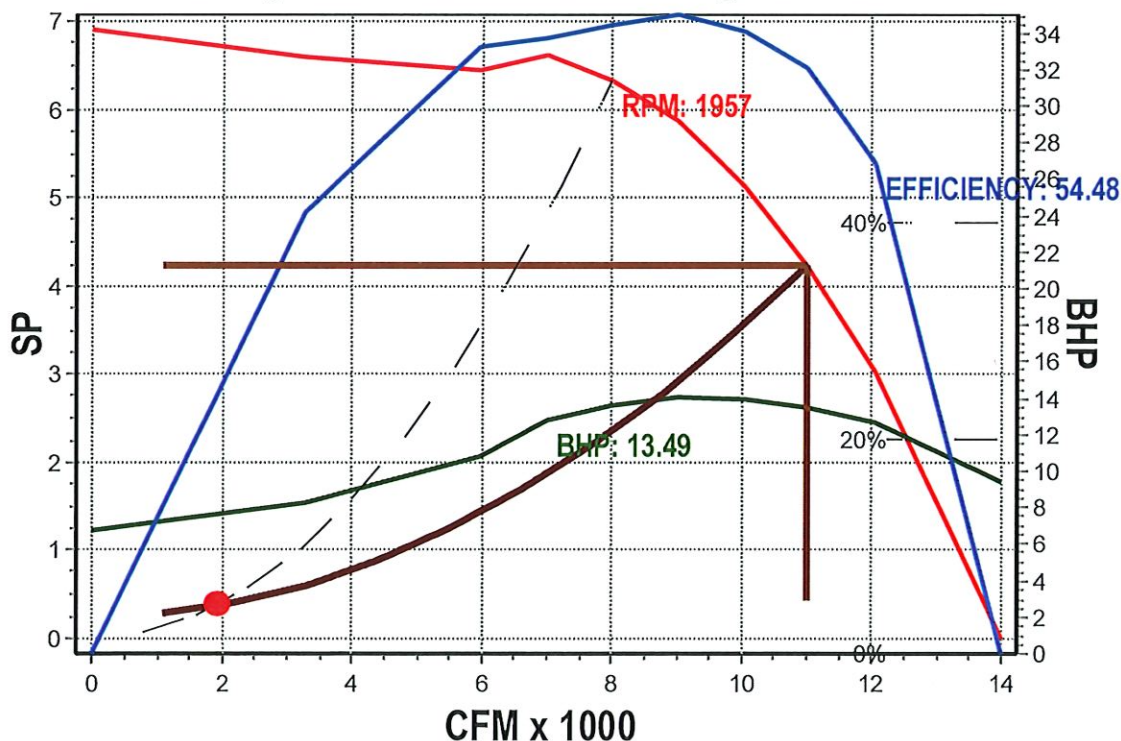
FAN SOUND POWER (Inlet/Outlet):

Octave Band:		(Re 10 ⁻¹² watts)							
1	2	3	4	5	6	7	8		
94	94	93	92	92	91	88	87		
97	95	95	101	101	97	93	89		

SOUND POWER A-Weighted: 98 / 104 dB

Max Duct SP with Blocked Airway: 6.6 in. Wg. @ 1957 rpm

Supply Fan Model: 245 @ 1957 RPM and 100% Width
Design Conditions: 11000 CFM @ 4.24" SP





22.0" STAR Plenum

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.307 (SN: 6554592-8QXGX130)

JOB INFORMATION:

Job Name: *Shango Lapeer Better New*
Job Tag: *Design REV 6*
Rep Firm: *RTU - Flower Rooms*
Date: *WPower Exhaust 82.5/76.6*
Jerome FitzGerald
06/11/2021

WHEEL SPECIFICATION:

Max RPM: *2,200*
Diameter x Qty: *22.0 in. x 1*
CFM: *22.0 in. x 1*
Tip Speed: *3000*
Inertia: *5,760 FPM*
5 WR²

OPERATING CONDITIONS:

Air Flow: *3,000 CFM*
Static Pressure: *0.25 in. Wg.*
Relief Dampers DP: *0.18 in. Wg.*

TSP: *0.43 in. Wg.*
Site Altitude: *0.00 Ft*
TSP @ Sea Level: *0.43 in. Wg.*

MOTOR SELECTION:

Rated HP / Bypass: *1 / No*
Frame Size: *143T*
Nominal RPM: *1760*
VAC/PH/Hz: *460/3/60*
Efficiency: *Premium 10.855*
Enclosure Type: *ODP*
Max Inertial Load: *15 WR²*

FAN PERFORMANCE:

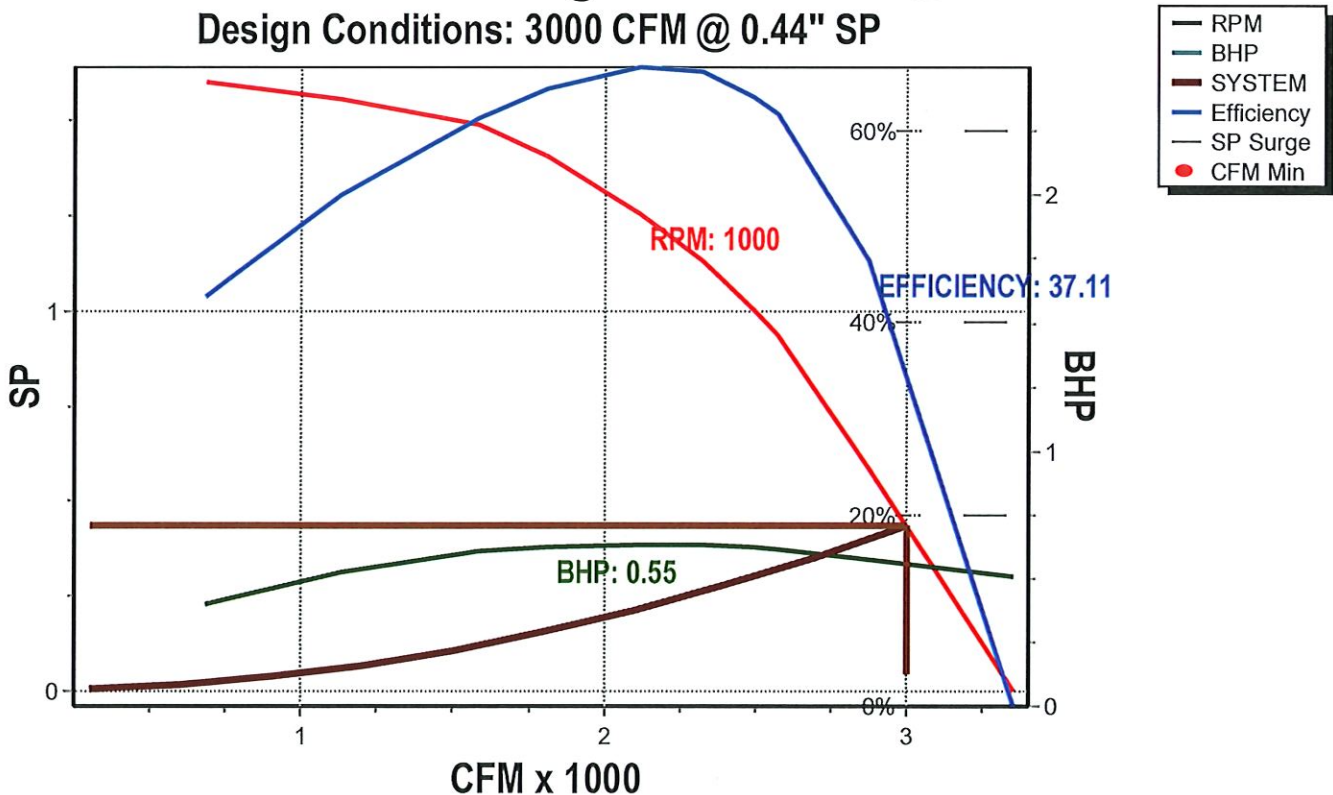
RPM: *1000*
BHP: *0.55*
Efficiency: *37.1%*
In/Out Velocity: *917/1010 FPM*
Plenum Out Velocity: *50 FPM*

FAN SOUND POWER (Inlet/Outlet):

Octave Band:		(Re 10 ⁻¹² watts)					
1	2	3	4	5	6	7	8
80	83	80	74	71	68	64	58
80	83	80	74	71	68	64	58

SOUND POWER A-Weighted: 81 / 81 dB

Exhaust Fan Model: RM220AB70 @ 1000 RPM and 100% Width Design Conditions: 3000 CFM @ 0.44" SP





Unit Submittal

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEat32 Ver. 4.307 (SN: 6554592-8QXGX130)

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

RN-030-3-0-EB09-16A:PELC-D0B-DDL-AG0-01FBH03-00-0000000VX

Tag: RTU - Flower Rooms W/Power Exhaust 82.5/76.6

Job Name:
Job Number:

Shango Lapeer Better New Design REV 6
21-0234

Unit Submittal For:
Unit Submittal Date:

June 11, 2021

	Base Option	Description
R	Series	Roof Top Unit
N	Generation	Ninth Generation
030	Unit Size	Thirty
3	Voltage	460V/3Ø/60Hz
0	Interior Protection	Standard
E	Refrigerant Style	R-410A Variable Capacity Scroll Compressor (VCC)
B	Unit Configuration	Air-Cooled Cond. + 6 Row Evap. Coil
0	Coil Coating	Standard
9	Cooling/Heat Pump Staging	Modulating - 1 VCC + 1 On/Off Comp.
1	Heating Type	Electric Heat
6	Heating Designation	Heat 6 - 60 kW
A	Heating Staging	Modulating/SCR Electric - 0-10V Control Signal

	Feature Option	Description
P	1A. RA/OA Section	Empty Energy Recovery Wheel Option Box + Power Exhaust
E	1B. RA/EA Blower Configuration	1 Blower + Premium Efficiency Motor + 1 VFD
L	1C. RA/EA Blower	22" Backward Curved Plenum - 70% Width with Banding
C	1D. RA/EA Blower Motor	1.0 hp - 1760 rpm
D	2. OA Control	Fully Modulating Actuator - Enthalpy Limit
0	3. Heat Options	Standard
B	4. Maintenance Options	115V Convenience Outlet - Factory Wired
D	5A. SA Blower Configuration	1 Blower + Premium Efficiency Motor + 1 VFD
D	5B. SA Blower	24" Direct Drive Backward Curved Plenum
L	5C. SA Motor	15 hp - 1760 rpm
A	6A. Pre Filter Type	2" Pleated Pre Filter - 30% Eff
G	6B. Unit Filter Type	4" Pleated - 85% Eff - MERV 13
0	6C. Filter Options	Standard
0	7. Refrigeration Control	Standard - Adj Comp. Cooling Lock Out Through Unit Controls
1	8. Refrigeration Options	All Circuit Parallel Modulating Hot Gas Reheat Microchannel Coil [MHGR-MC]
F	9. Refrigeration Accessories	VFD Condenser Fan - Head Pressure Control
B	10. Power Options	Non-fused Disconnect Power Switch - 150 Amps
H	11. Safety Options	Remote Safety Shutdown Terminals
0	12. Controls	Standard
3	13. Special Controls	VAV Single Zone Unit Controller - VAV Cool + VAV Heat
0	14A. Outside Air 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. Electrical Rating	Standard - 5 KAIC
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	VCC-X Controls + Integrated BACnet MSTP
X	23. Type	Special Price Authorization + AAON Gray Paint



VCCX Components

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.307 (SN: 6554592-8QXGX130)

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

RN-030-3-0-EB09-16A:PELC-D0B-DDL-AG0-01FBH03-00-0000000VX

Tag: RTU - Flower Rooms W/Power Exhaust 82.5/76.6

Job Name: *Shango Lapeer Better New* VCCX For:
Design REV 6

Job Number: *21-0234* VCCX Date: *June 11, 2021*

Hardware Included For VCCX Controller

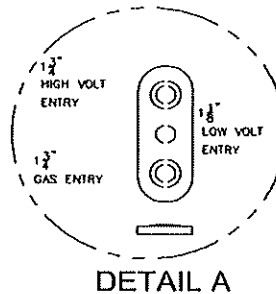
Part #	Included Parts	Assigned Channel	BACnet Point
ASM01698	VCCX2 CONTROLLER		
ASM01692	OSA Temp/Hum Sensor	EBUS2 communicating sensor	AI:16, AI:17, AI:18, AI:19
ASM01820	Space Digital Temp/Hum Sensor	EBUS3 communicating sensor	AI:12, AI:13
R82890	Supply Temp Sensor - Field Installed	VCCX control point 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
	Modulated Heating (0-10VDC)	VCCX control point AO 3	AI:35
R62330	Proof of Air Flow	VCCX control point BI 1	BI:6, BI:24
	Safety Shut Down	VCCX control point BI 8	BI:26
	Supply Fan	Configured Relay Point	BI:47
	Heat 1	Configured Relay Point	BI:48
	Heat 2	Configured Relay Point	BI:49
ASM02201	DIGITAL REFRIGERATION MODULE		
R42680	Comp Discharge Temp A	RSMD point TEMP1	AI:66
V38391	Suction Pressure Sensor A	RSMD point SP-1	AI:48
V38410	Discharge Pressure Sensor A	RSMD point HP-1	AI:50
V38410	Discharge Pressure Sensor B	RSMD point HP-2	AI:75
	Modulated Condenser Signal AB	RSMD point AO1	AI:46
	Comp Status Input A	RSMD point BIN1	BI:77
	Comp Status Input B	RSMD point BIN2	BI:78
	Emergency Shutdown	RSMD point BIN4	BI:83
	Comp Unload Signal A	RSMD point T1	AI:44
	Comp Enable A	RSMD Fixed Relay point	BI:84
	Comp Enable B	RSMD Fixed Relay point	BI:85
ASM01670	MODULATING HOT GAS REHEAT MODULE		
	Reheat HGR Valve	MHGRV-X	AI:42

RN SERIES

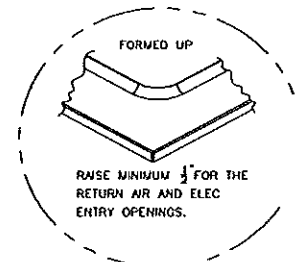
C - CABINET WITH ECONOMIZER ~ 16-30 TON

EMPTY ENERGY RECOVERY SECTION WITH POWER EXHAUST

CLEARANCES	
LOCATION	• UNIT SIZE • 16 - 30 TON
OUTSIDE AIR (BACK)	48
CONTROLS SIDE (FRONT)	48
LEFT SIDE	6
RIGHT SIDE	60
TOP	UNOBSTRUCTED



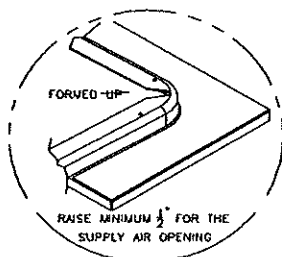
DETAIL A



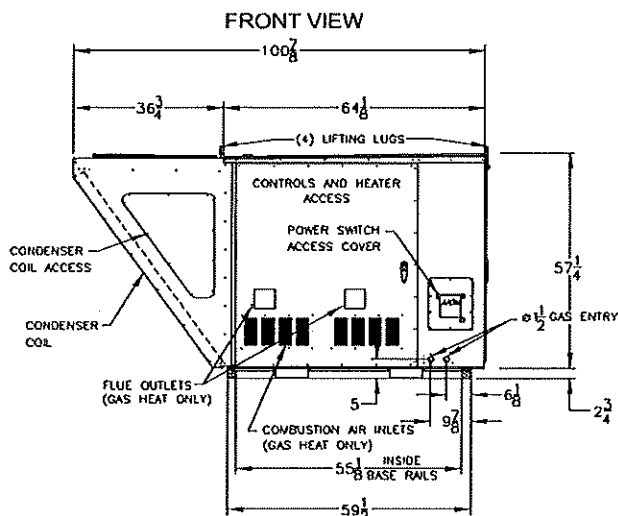
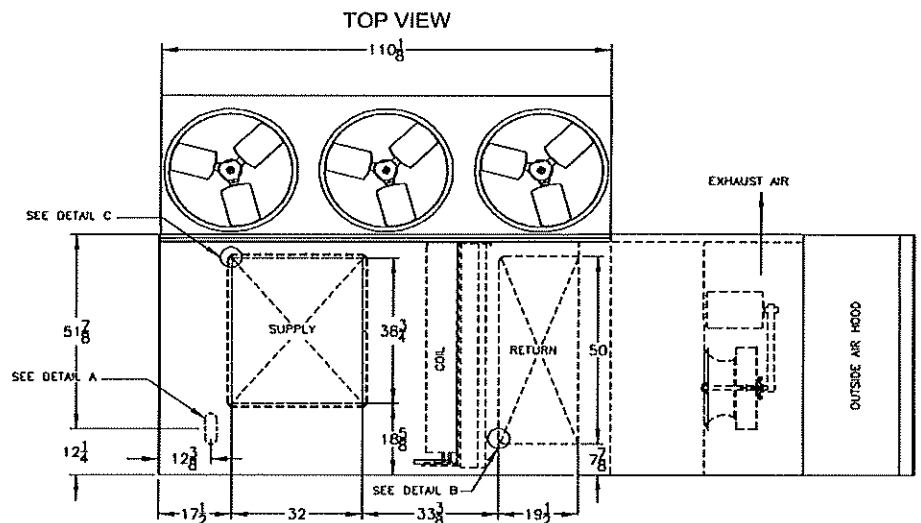
DETAIL B

NUMBER OF CONDENSER FANS

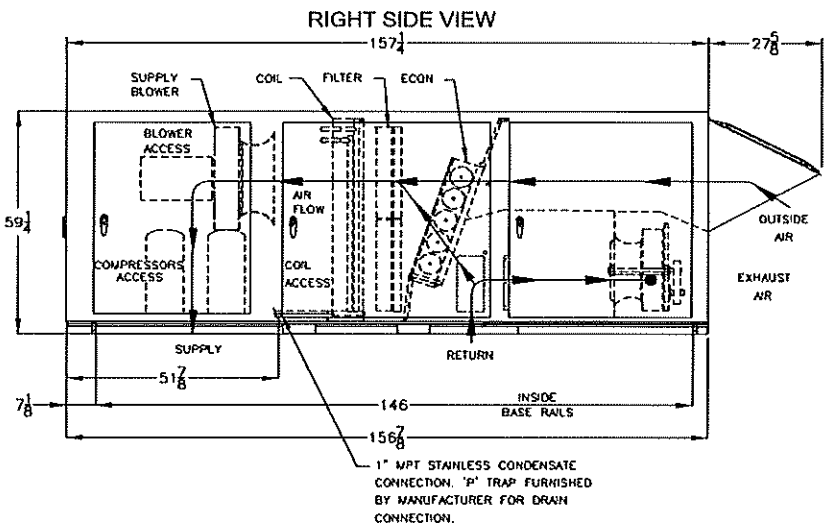
16, 18 & 20 TON - 2 FANS
25 & 30 TON - 3 FANS



DETAIL C



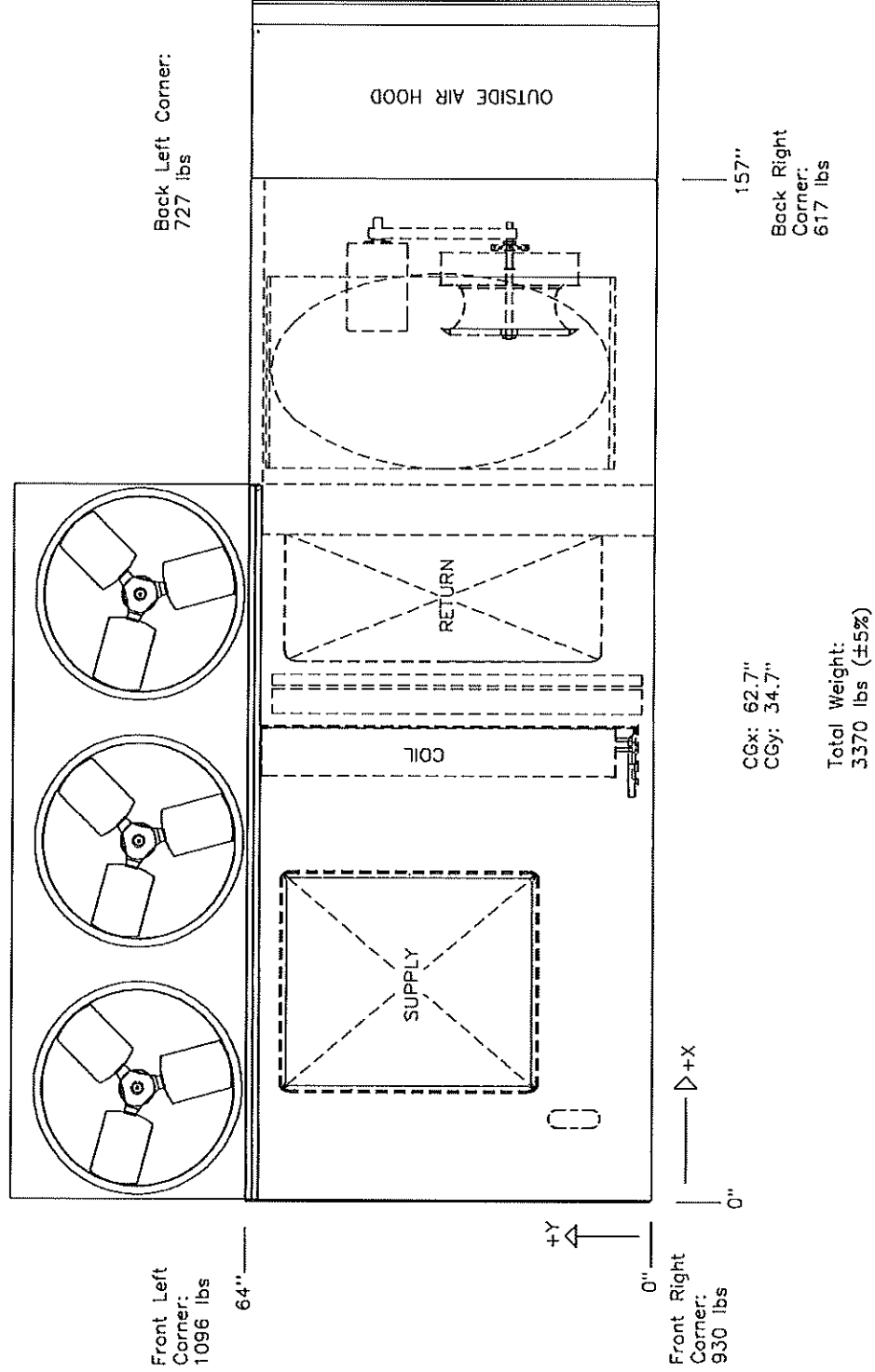
RNC-00007 REV:C 08/23/10 JWC
NOTE: ALL DIMENSIONS ARE IN INCHES



RNC CABINET AIR COOLED CONDENSING UNIT WITH ENERGY RECOVERY SECTION



RN-030-3-0-EB09-16A:PELC-D0B-DDL-AG0-01FBH03-00-00000000VX



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



DRY ROOM UNITS



Unit Rating

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.307 (SN: 6554592-8QXGX130)

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

RN-008-3-0-FB09-12A:5000-00B-DCD-AG0-01FAH0E-00-0000000VX

Tag: RTU - Dry Rooms

(Values do not account for changes described in SPA)

Job Information

Job Name: Shango Lapeer Grow Facility
Job Number: 21-0234
Site Altitude: 0 ft
Refrigerant: R-410A

Unit Information

****WEIGHT AND PERFORMANCE DO NOT INCLUDE SPA**

Approx. Op./Ship Weights: 1114 / 1114 lbs. (±5%)
Supply CFM/ESP: 2400 / 1 in. wg.
Pre-Filter FV / Qty: 270.00 fpm / 4
Final Filter FV / Qty: 270.00 fpm / 4
Ambient Temperature: 95 °F DB / 75 °F WB
Return Temperature: 72 °F DB / 61.4 °F WB

Static Pressure

External: 1.00 in. wg.
Evaporator: 0.35 in. wg.
Filters Clean: 0.25 in. wg.
Dirt Allowance: 0.35 in. wg.

Economizer: 0.00 in. wg.
Heating: 0.02 in. wg.
Cabinet: 0.08 in. wg.
Re-Heat Coil: 0.04 in. wg.
Total: 2.08 in. wg.

Cooling Section

	Gross	Net
Total Capacity:	88.11	84.42 MBH
Sensible Capacity:	62.70	59.01 MBH
Latent Capacity:	25.41 MBH	
Mixed Air Temp:	72.00 °F DB	61.40 °F WB
Entering Air Temp:	72.00 °F DB	61.40 °F WB
Lv Air Temp (Coil):	47.67 °F DB	47.63 °F WB
Lv Air Temp (Unit):	49.08 °F DB	48.27 °F WB
Digital Comp. Capacity Ratio:	100%	
Supply Air Fan:	1 x RNA185 @ 1.25 BHP	
SA Fan RPM / Width:	1473 / 4.140"	
Evaporator Coil:	8.5 ft ² / 6 Rows / 14 FPI	
Evaporator Face Velocity:	282.1 fpm	

Heating Section

PreHeat Type: Std (No Preheat)
Heating Type: Electric Heat
Heating CFM: 2400
Total Capacity: 68.3 MBH
OA Temp: 0.0 °F DB / 0.0 °F WB
RA Temp: 72.0 °F DB / 61.4 °F WB
Entering Air Temp: 72.0 °F DB / 61.4 °F WB
Leaving Air Temp: 98.3 °F DB / 69.9 °F WB
Input: 20.0 kW
Heater Qty: 2
Electric Heat FLA: 24.1

Re-Heat Coil:

Capacity: 63 MBH
LA DB / WB: 72.00 °F / 57.82 °F
RH: 42%

Rating Information

Cooling Capacity (MBH): 94.0
Cooling EER: 11.3
Cooling IEER: 13.2
Rated in accordance with AHRI 340/360

Application EER @ Op. Conditions: 9.6

2400	Supply Air CFM
72.0°FDB @ 55% RH	Indoor Design Conditions
64.6	Indoor Design GR/LB
72.0/57.82	AHU LAT °FDB/°FWB
48.9	AHU LAT GR/LB
24.22	LBS/HR Moisture Removal Capacity at 72.0°FDB @ 55% RH Room Design Conditions

Electrical Data

Rating: 460/3/60
Unit FLA: ~~28~~ 46
SCCR: 5 KAIC

Minimum Circuit Amp: ~~34~~ 55
Maximum Overcurrent: ~~35~~ 60

	Qty	HP	VAC	Phase	RPM	FLA	RLA
Compressor 1:	1		460	3			12.6
Condenser Fans:	1	0.75	460	3	1080	1.8	
Supply Fan:	1	2.00	460	3	1760	3.4	

Cabinet Sound Power Levels*

Octave Bands:	63	125	250	500	1000	2000	4000	8000
Discharge LW(dB):	82	81	83	78	71	68	65	59
Return LW(dB):	72	72	70	62	58	52	41	28

*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) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.307 (SN: 6554592-8QXGX130)

JOB INFORMATION:

Job Name: Shango Lapeer Grow Facility
Job Tag: RTU - Dry Rooms
Rep Firm: Jerome FitzGerald
Date: 06/11/2021

WHEEL SPECIFICATION:

Max RPM: 2,200
Diameter x Qty: 18.5 in. x 1
CFM: 2400
Tip Speed: 7,134 FPM
Inertia: 3 WR²

OPERATING CONDITIONS:

Air Flow: 2,400 CFM
Static Pressure: 2.08 in. Wg.
Relief Dampers DP: 0.00 in. Wg.

TSP: 2.08 in. Wg.
Site Altitude: 0.00 Ft
TSP @ Sea Level: 2.08 in. Wg.

MOTOR SELECTION:

Rated HP / Bypass: 2 / No
Frame Size: 145T
Nominal RPM: 1760
VAC/PH/Hz: 460/3/60
Efficiency: Premium / 0.865
Enclosure Type: ODP
Max Inertial Load: 27 WR²

FAN PERFORMANCE:

RPM: 1473
BHP: 1.25
Efficiency: 62.8%
In/Out Velocity: 1371/1437 FPM
Plenum Out Velocity: 40 FPM

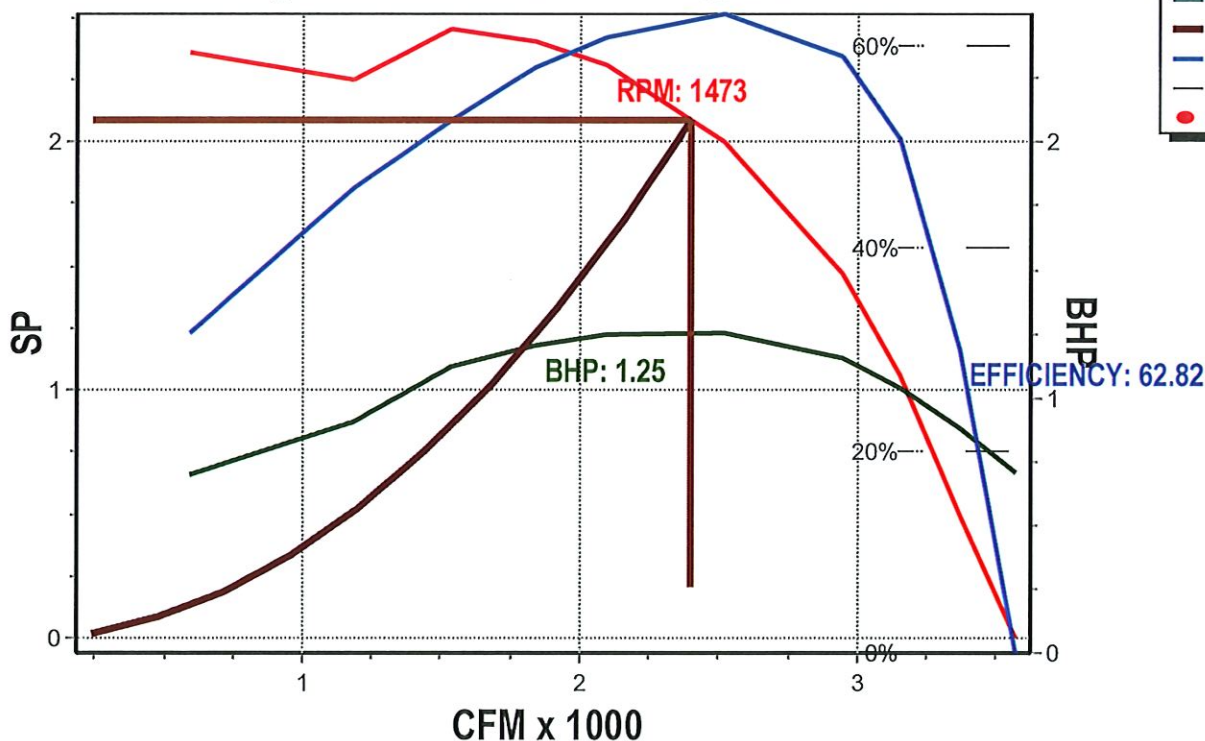
FAN SOUND POWER (Inlet/Outlet):

Octave Band:				(Re 10 ⁻¹² watts)			
1	2	3	4	5	6	7	8
82	81	83	80	74	72	69	63
82	81	83	80	74	72	69	63

SOUND POWER A-Weighted: 83 / 83 dB

Max Duct SP with Blocked Airway: 2.5 in. Wg. @ 1473 rpm

Supply Fan Model: RNA185 @ 1473 RPM and 100% Width
Design Conditions: 2400 CFM @ 2.08" SP





Unit Submittal

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.307 (SN: 6554592-8QXGX130)

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

RN-008-3-0-FB09-12A:5000-00B-DCD-AG0-01FAH0E-00-0000000VX

Tag: RTU - Dry Rooms

Job Name:
Job Number:

Shango Lapeer Grow Facility
21-0234

Unit Submittal For:
Unit Submittal Date:

June 11, 2021

	Base Option	Description
R	Series	Roof Top Unit
N	Generation	Ninth Generation
008	Unit Size	Eight
3	Voltage	460V/3Ø/60Hz
0	Interior Protection	Standard
F	Refrigerant Style	R-410A VCC - Standard Efficiency
B	Unit Configuration	Air-Cooled Cond. + 6 Row Evap. Coil
0	Coil Coating	Standard
9	Cooling/Heat Pump Staging	Modulating - 1 Variable Capacity Compressor
1	Heating Type	Electric Heat
2	Heating Designation	Heat 2 - 20 kW
A	Heating Staging	Modulating/SCR Electric - 0-10V Control Signal

	Feature Option	Description
5	1A. RA/OA Section	100% Return Air (No O/A Opening)
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	Standard - None
0	3. Heat Options	Standard
B	4. Maintenance Options	115V Convenience Outlet - Factory Wired
D	5A. SA Blower Configuration	1 Blower + Premium Efficiency Motor + 1 VFD
C	5B. SA Blower	18.5" Direct Drive Backward Curved Plenum
D	5C. SA Motor	2.0 hp - 1760 rpm
A	6A. Pre Filter Type	2" Pleated Pre Filter - 30% Eff
G	6B. Unit Filter Type	4" Pleated - 85% Eff - MERV 13
0	6C. Filter Options	Standard
0	7. Refrigeration Control	Standard - Adj Comp. Cooling Lock Out Through Unit Controls
1	8. Refrigeration Options	Parallel Modulating Hot Gas Reheat Microchannel Coil [MHGR-MC] - Single Circuit
F	9. Refrigeration Accessories	VFD Condenser Fan - Head Pressure Control
A	10. Power Options	Non-fused Disconnect Power Switch - 100 Amps
H	11. Safety Options	Remote Safety Shutdown Terminals
0	12. Controls	Standard
E	13. Special Controls	Constant Volume (CV) Unit Controller - CV Cool + CV Heat
0	14A. Outside Air 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. Electrical Rating	Standard - 5 KAIC
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	VCC-X Controls + Integrated BACnet MSTP
X	23. Type	Special Price Authorization + AAON Gray Paint



VCCX Components

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.307 (SN: 6554692-8QXGX130)

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

RN-008-3-0-FB09-12A:5000-00B-DCD-AG0-01FAH0E-00-0000000VX

Tag: RTU - Dry Rooms

Job Name:

Shango Lapeer Grow Facility VCCX For:

Job Number:

21-0234

VCCX Date:

June 11, 2021

Hardware Included For VCCX Controller

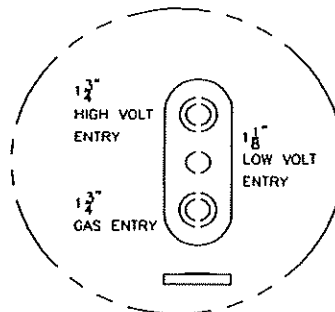
Part #	Included Parts	Assigned Channel	BACnet Point
ASM01698	VCCX2 CONTROLLER		
ASM01820	Space Digital Temp/Hum Sensor	EBUS3 communicating sensor	AI:12, AI:13
R82890	Supply Temp Sensor - Field Installed	VCCX control point AI 3	AI:9
R81550	Outside Temp Sensor	VCCX control point AI 7	AI:16
	Supply Fan Control Signal 0-10VDC	VCCX control point AO 1	AI:22
	Modulated Heating (0-10VDC)	VCCX control point AO 3	AI:35
R62330	Proof of Air Flow	VCCX control point BI 1	BI:6, BI:24
	Safety Shut Down	VCCX control point BI 8	BI:26
	Supply Fan	Configured Relay Point	BI:47
	Heat 1	Configured Relay Point	BI:48
ASM02201	DIGITAL REFRIGERATION MODULE		
R42680	Comp Discharge Temp A	RSMD point TEMP1	AI:66
V38391	Suction Pressure Sensor A	RSMD point SP-1	AI:48
V38410	Discharge Pressure Sensor A	RSMD point HP-1	AI:50
	Modulated Condenser Signal A	RSMD point AO1	AI:46
	Comp Status Input A	RSMD point BIN1	BI:77
	Emergency Shutdown	RSMD point BIN4	BI:83
	Comp Unload Signal A	RSMD point T1	AI:44
	Comp Enable A	RSMD Fixed Relay point	BI:84
ASM01670	MODULATING HOT GAS REHEAT MODULE		
	Reheat HGR Valve	MHGRV-X	AI:42

RN SERIES

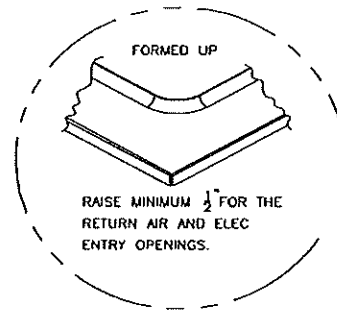
A - CABINET STANDARD WITH 100% RETURN AIR ~ 6-10 TON

CLEARANCES	
LOCATION	• UNIT SIZE • 6 - 10 TON
OUTSIDE AIR (BACK)	36
CONTROLS SIDE (FRONT)	48
LEFT SIDE	6
RIGHT SIDE	48
TOP	UNOBSTRUCTED

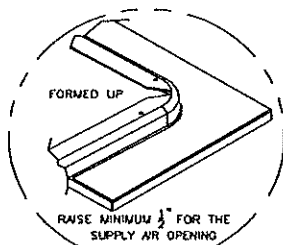
NOTE: THE RNA UNIT IS NOT COMPATIBLE WITH PREVIOUS GENERATIONS OF AAO CURBS. AN ADAPTER CURB IS AVAILABLE IN ECAT.



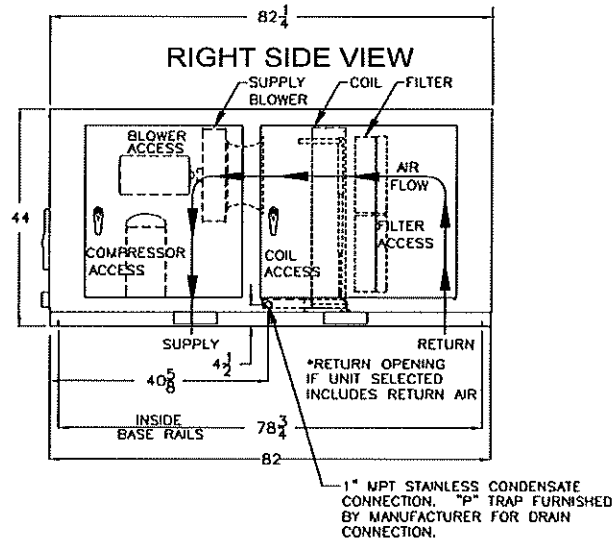
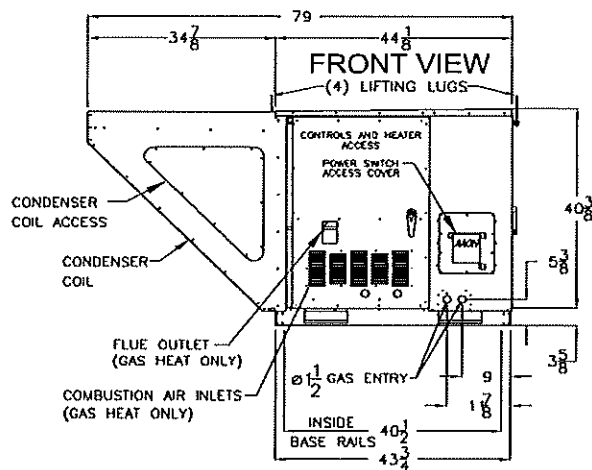
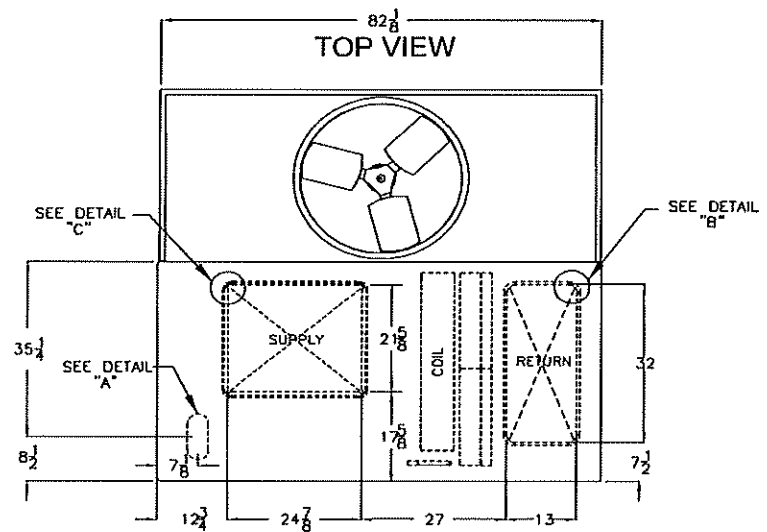
DETAIL A



DETAIL B



DETAIL C



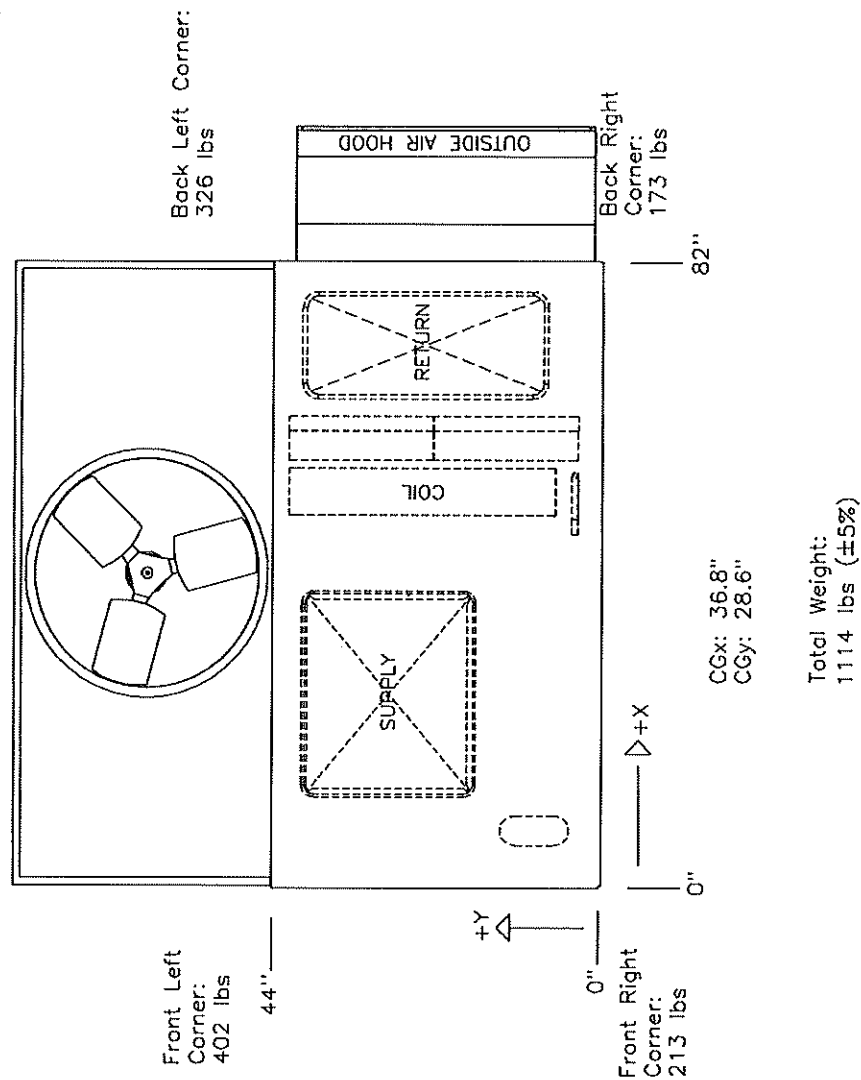
RNA-00079 NEW 12/03/10 JRL

NOTE: ALL DIMENSIONS ARE IN INCHES

RNA CABINET AIR COOLED CONDENSING UNIT



RN-008-3-0-FB09-12A:5000-00B-DCD-AG0-01FAH0E-00-00000000VX



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



OFFICE UNITS



Unit Rating

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.307 (SN: 6554592-8QXGX130)

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-005-3-H-FA09-252:A000-D0B-QJD-AG0-C0DAH02-00-0000000VB

Tag: RTU - Offices

Job Information

Job Name: Shango Lapeer Grow Facility
Job Number: 21-0234
Site Altitude: 0 ft
Refrigerant: R-410A

Unit Information

Approx. Op./Ship Weights: 913 / 913 lbs. (±5%)
Supply CFM/ESP: 2000 / 1 in. wg.
Pre-Filter FV / Qty: 360.00 fpm / 2
Final Filter FV / Qty: 360.00 fpm / 2
Outside CFM: 400
Ambient Temperature: 95 °F DB / 75 °F WB
Return Temperature: 75 °F DB / 62 °F WB

Static Pressure

External: 1.00 in. wg.
Evaporator: 0.28 in. wg.
Filters Clean: 0.39 in. wg.
Dirt Allowance: 0.35 in. wg.

Economizer: 0.35 in. wg.
Heating: 0.18 in. wg.
Cabinet: 0.15 in. wg.
Total: 2.69 in. wg.

Cooling Section

	Gross	Net
Total Capacity:	59.01	53.99 MBH
Sensible Capacity:	48.14	43.12 MBH
Latent Capacity:	10.87 MBH	
Mixed Air Temp:	79.00 °F DB	64.91 °F WB
Entering Air Temp:	79.00 °F DB	64.91 °F WB
Lv Air Temp (Coil):	56.32 °F DB	54.78 °F WB
Lv Air Temp (Unit):	58.61 °F DB	55.70 °F WB
Digital Comp. Capacity Ratio:	100%	
Supply Air Fan:	1 x RQ185-VFD @ 1.61 BHP	
SA Fan RPM / Width:	1779 / 3.000"	
Evaporator Coil:	5.3 ft ² / 3 Rows / 14 FPI	
Evaporator Face Velocity:	381.0 fpm	

Heating Section

PreHeat Type: Std (No Preheat)
Heating Type: Nat. Gas Heat
Heating CFM: 2000
Total Capacity: 113.4 MBH
OA Temp: 0.0 DB / 0.0 °F WB
RA Temp: 70.0 °F DB / 51.0 °F WB
Entering Air Temp: 56.0 °F DB / 43.3 °F WB
Leaving Air Temp: 108.5 °F DB / 64.6 °F WB
Input: 140.0 MBH
Heater Qty (Hi/Low): 1
Consumption: 140.0 MBH
Operation: N/A
Total Turndown Ratio: 1.4:1

Rating Information

Cooling Capacity (MBH): 57.5
Cooling SEER: 13.5
Cooling EER: 11.6

Rated in accordance with AHRI 210/240

Application EER @ Op. Conditions: 8.8

Electrical Data

Rating: 460/3/60
Unit FLA: 13
SCCR: 5 KAIC

Minimum Circuit Amp: 15
Maximum Overcurrent: 20

	Qty	HP	VAC	Phase	RPM	FLA	RLA
Compressor 1:	1		460	3			8.1
Condenser Fans:	1	0.333	460	1	1110	1.6	
Supply Fan:	1	2.00	460	3	1760	3.4	
Combustion:	1	0.09	460	1	3000	0.7	

Cabinet Sound Power Levels*

Octave Bands:	63	125	250	500	1000	2000	4000	8000
Discharge LW(dB):	86	84	87	82	75	73	70	65
Return LW(dB):	83	81	78	71	68	64	56	49

*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) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.307 (SN: 6554592-8QXGX130)

JOB INFORMATION:

Job Name: Shango Lapeer Grow Facility
Job Tag: RTU - Offices
Rep Firm: Jerome FitzGerald
Date: 06/11/2021
06/11/2021

WHEEL SPECIFICATION:

Max RPM: 2,200
Diameter x Qty: 18.5 in. x 1
CFM: 2000
Tip Speed: 8,616 FPM
Inertia: 8,616 FPM

OPERATING CONDITIONS:

Air Flow: 2,000 CFM
Static Pressure: 2.69 in. Wg.
Relief Dampers DP: 0.00 in. Wg.

TSP: 2.69 in. Wg.
Site Altitude: 0.00 Ft
TSP @ Sea Level: 2.69 in. Wg.

MOTOR SELECTION:

Rated HP / Bypass: 2 / No
Frame Size: 48
Nominal RPM: 1760
VAC/PH/Hz: 460/3/60
Efficiency: Standard / 0.815
Enclosure Type: ODP
Max Inertial Load: 27 WR²

FAN PERFORMANCE:

RPM: 1779
BHP: 1.61
Efficiency: 52.8%
In/Out Velocity: /FPM
Plenum Out Velocity: 33 FPM

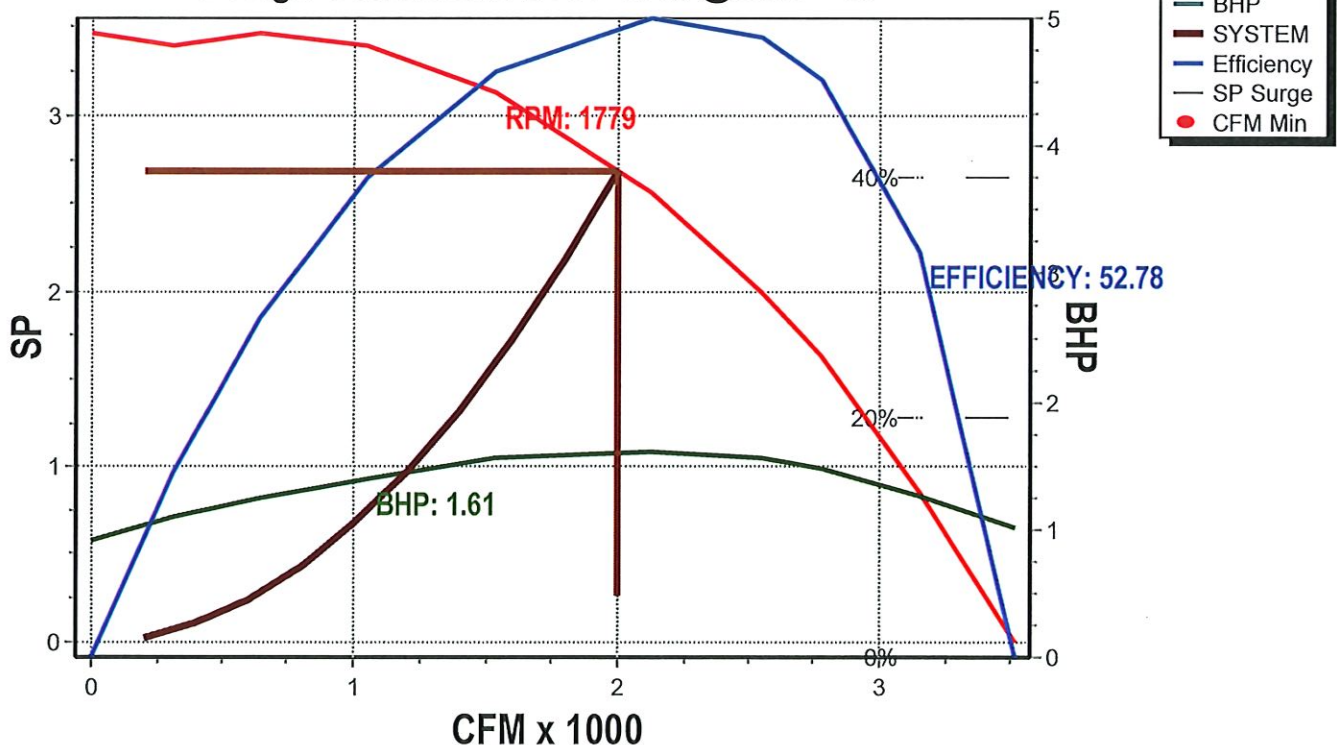
FAN SOUND POWER (Inlet/Outlet):

Octave Band:		(Re 10 ⁻¹² watts)						
1	2	3	4	5	6	7	8	
86	84	87	84	78	76	74	69	
86	84	87	84	78	76	74	69	

SOUND POWER A-Weighted: 88 / 88 dB

Max Duct SP with Blocked Airway: 3.5 in. Wg. @ 1779 rpm

Supply Fan Model: RQ185-VFD @ 1779 RPM and 100% Width Design Conditions: 2000 CFM @ 2.69" SP





Unit Submittal

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.307 (SN: 6554592-8QXGX130)

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-005-3-H-FA09-252:A000-D0B-QJD-AG0-C0DAH02-00-0000000VB
Tag: RTU - Offices

Job Name:
Job Number:

Shango Lapeer Grow Facility
21-0234

Unit Submittal For:
Unit Submittal Date:

June 11, 2021

	Base Option	Description
R	Series	Roof Top Unit
Q	Generation	Tenth Generation
005	Unit Size	Five
3	Voltage	460V/3Ø/60Hz
H	Interior Protection	Horizontal Discharge and Return
F	Refrigerant Style	R-410A VCC - Standard Efficiency
A	Unit Configuration	Air-Cooled Cond. + Std Evap. Coil
0	Coil Coating	Standard
9	Cooling/Heat Pump Staging	Modulating - 1 Variable Capacity Compressor
2	Heating Type	Natural Gas Aluminized
5	Heating Designation	Heat 5 - 140 MBtu/h
2	Heating Staging	2 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. OA 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
A	6A. Pre Filter Type	2" Pleated Pre Filter - 30% Eff
G	6B. Unit Filter Type	4" Pleated - 85% Eff - MERV 13
0	6C. Filter Options	Standard
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
H	11. Safety Options	Remote Safety Shutdown Terminals
0	12. Controls	Standard
2	13. Special Controls	VAV Single Zone Unit Controller - VAV Cool + CAV Heat
0	14A. Outside Air 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. Electrical Rating	Standard - 5 KAIC
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 Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.307 (SN: 6554692-8QXGX130)

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RQ-005-3-H-FA09-252:A000-D0B-QJD-AG0-C0DAH02-00-0000000VB

Tag: RTU - Offices

Job Name:

Shango Lapeer Grow Facility VCCX For:

Job Number:

21-0234

VCCX Date:

June 11, 2021

Hardware Included For VCCX Controller

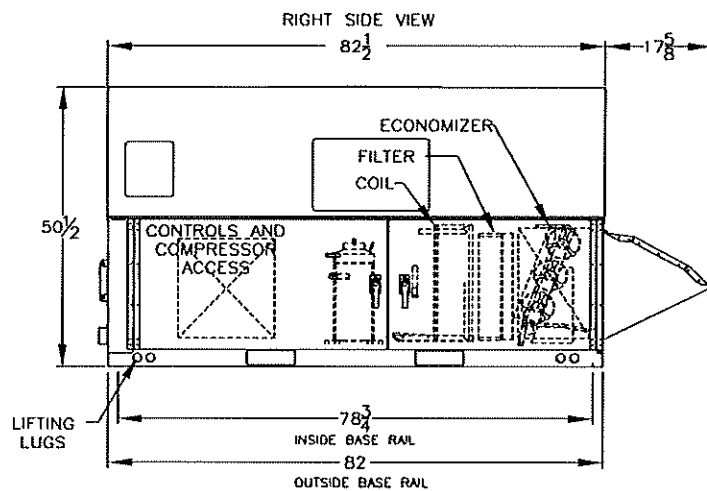
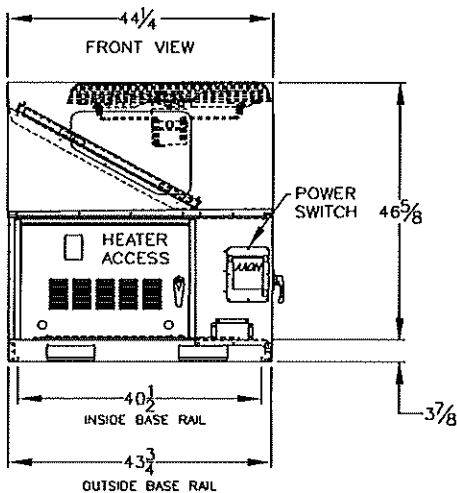
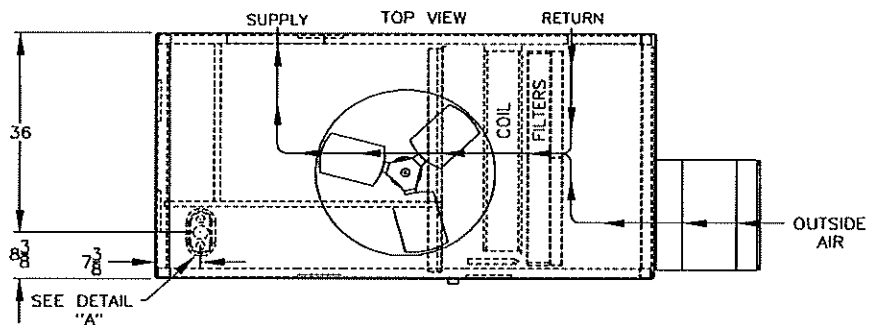
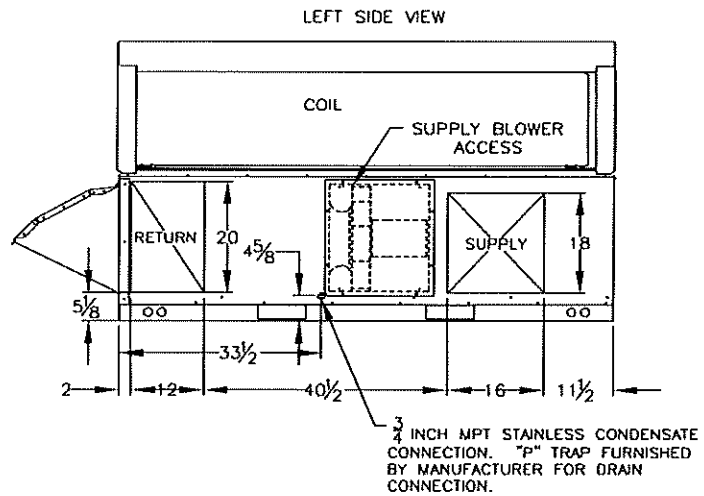
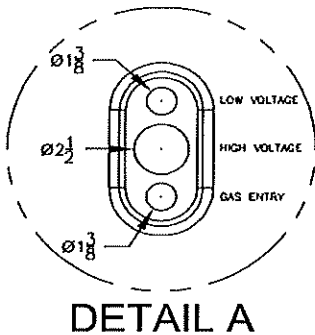
Part #	Included Parts	Assigned Channel	BACnet Point
ASM01698	VCCX2 CONTROLLER		
ASM01643	Space Temp Sensor	VCCX control point AI 1	AI:12
ASM01692	OSA Temp/Hum Sensor	EBUS2 communicating sensor	AI:16, AI:17, AI:18, AI:19
ASM01643	Space Temp Slide Adjust	VCCX control point AI 2	AI:8
R82890	Supply Temp Sensor - Field Installed	VCCX control point AI 3	AI:9
	Supply Fan Control Signal 0-10VDC	VCCX control point AO 1	AI:22
	Economizer	VCCX control point AO 2	AI:30
R62330	Proof of Air Flow	VCCX control point BI 1	BI:6, BI:24
	Safety Shut Down	VCCX control point BI 8	BI:26
	Supply Fan	Configured Relay Point	BI:47
	Heat 1	Configured Relay Point	BI:48
	Heat 2	Configured Relay Point	BI:49
ASM02201	DIGITAL REFRIGERATION MODULE		
R57800	Comp Discharge Temp A	RSMD point TEMP1	AI:66
V38391	Suction Pressure Sensor A	RSMD point SP-1	AI:48
	Comp Status Input A	RSMD point BIN1	BI:77
	Emergency Shutdown	RSMD point BIN4	BI:83
	Comp Unload Signal A	RSMD point T1	AI:44
	Comp Enable A	RSMD Fixed Relay point	BI:84

RQ CABINET ECONOMIZER HORIZONTAL ~ 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

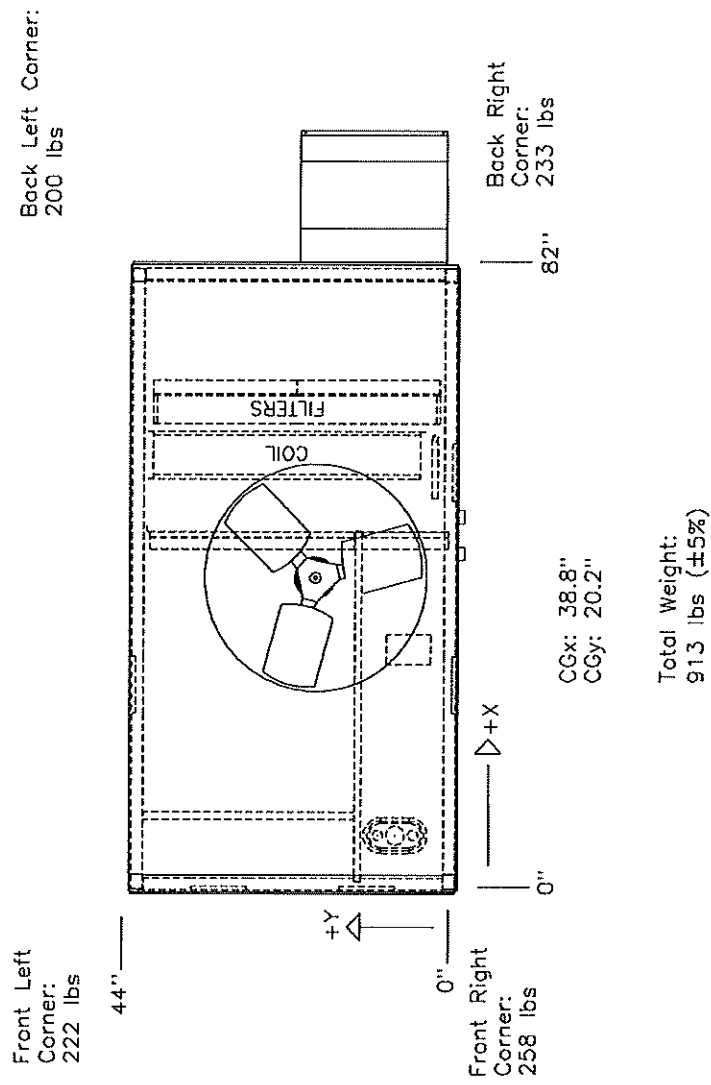
*CLEARANCE IS MEASURED
FROM THE END OF THE
OUTSIDE AIR RAIN HOOD



RQ CABINET HORIZONTAL AIR COOLED CONDENSING UNIT



RQ-005-3-H-FA09-252:A000-D0B-QJD-AG0-C0DAH02-00-00000000VB



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



CONTROLS



Heating & Cooling Products

VCCX2 Controller

ASM01698 ALT-REF number OE338-26B-VCCX2

Description

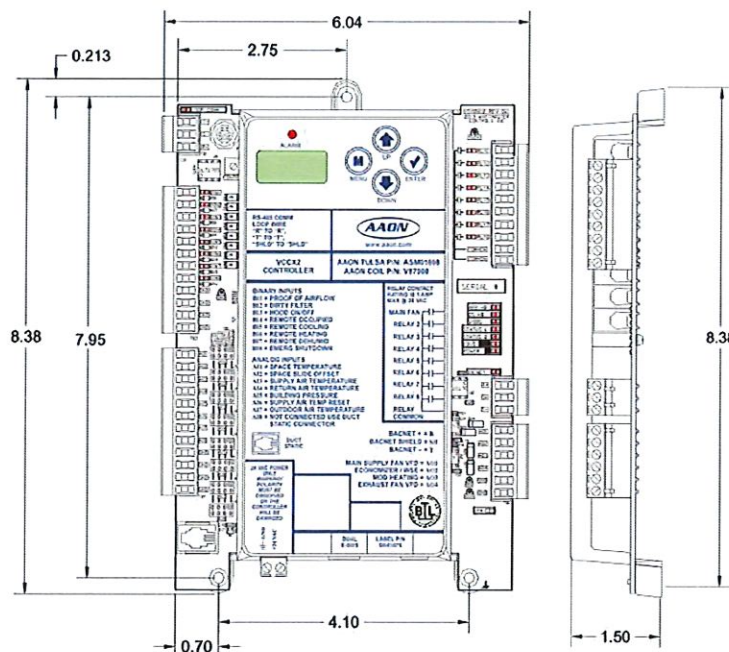
The VCCX2 Controller is designed with 8 analog inputs, 4 analog outputs, 8 binary inputs, and 8 relay outputs.

The VCCX2 Controller has an on-board BACnet® port for connection to a BACnet® MS/TP network.

There are also 2 E-BUS Expansion Ports which allow the connection of communicating sensors and E-BUS Modules via modular cable assemblies.

The VCCX2 Controller contains a 2 x 8 LCD character display and 4 buttons that allow for status and alarm display as well as BACnet® configuration.

The VCCX2 Controller provides for Constant Volume, VAV, Make-Up Air, and Single Zone VAV applications. Single Zone VAV applications can be configured for VAV Cooling and either CAV or VAV Heating.



Mounting

The VCCX2 Controller is housed in a plastic enclosure. It is designed to be mounted by using the 3 mounting holes in the enclosure base. The VCCX2 Controller needs to be installed in an environment which can maintain a temperature range between -30°F and 150°F not to exceed 95% RH levels (Non-Condensing). It is important to mount the controller in a location that is free from extreme high or low temperatures, moisture, dust, and dirt. Be careful not to damage the electronic components when mounting the controller.

Technical Data		VCCX2 Controller	
Operating Power	18-30 VAC	Power Consumption	15 VA Maximum
Operating Temp	-30°F to 150°F	Operating Humidity	0-95% RH Non-Condensing
Communications	AAON Communications E-BUS, BACnet® MS/TP	Weight	1 lb.
Inputs	8 Analog Inputs, 8 Binary Inputs	Outputs	4 Analog Outputs, 8 Relay Outputs
One Year Warranty		AAON reserves the right to change specifications without notice	



Heating & Cooling Products

RSMD Module

ASM02201 ALT-REF number OE370-26-RSMD

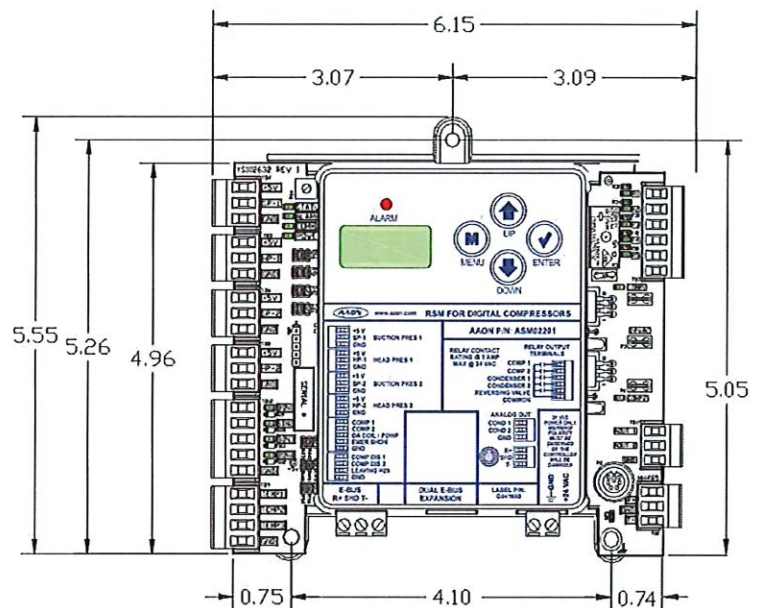
Description

The Refrigerant System Module for Digital Compressors (RSMD) can monitor and control up to two compressors and condensers. The compressors can be in either a tandem or non-tandem configuration. The module is designed for R410-A refrigerant.

The RSMD Module is connected to the VCCX2 Controller. Up to 4 RSMD Modules can be connected, depending on the size of the system.

Additional Features

- Modulates the Compressors to satisfy the Suction Coil (Saturated) Temperature. The Suction Coil (Saturated) Temperature Setpoint is reset by the VCC-X/VCCX2 Controller to maintain the Supply Air Temperature during Cooling mode. During Dehumidification mode, it controls the Compressors to the Suction (Saturation) Temperature Setpoint.
- In Heating mode, the RSMD modulates and stages the compressors to maintain a given Supply Air Temperature Setpoint.
- Modulates the Condenser Fan or Valve to maintain the Head Pressure Setpoint.
- Provides alarms and safeties for the compressor and condenser operation.
- Allows connection of the Modular Service Tool SD to the module when required communication wire is run to the VCCX2 Controller.
- Provides a 2 x 8 LCD character display and 4 buttons that allow for status of system operation, system setpoints, system configurations, sensors, and alarms, and to change the module's address, if necessary.



Mounting

The RSMD Module is housed in a plastic enclosure. It is designed to be mounted by using the 3 mounting holes in the enclosure base. It is important to mount the module in a location that is free from extreme high or low temperatures, moisture, dust, and dirt. Be careful not to damage the electronic components when mounting the module.

Technical Data		RSMD Module	
Operating Power	18-30 VAC	Power Consumption	18 VA Maximum
Operating Temp	-30°F to 150°F	Operating Humidity	0-95% RH Non-Condensing
Communications	E-BUS	Weight	8 oz.
One Year Warranty		AAON reserves the right to change specifications without notice	



Heating & Cooling Products

MHGRV-X Controller

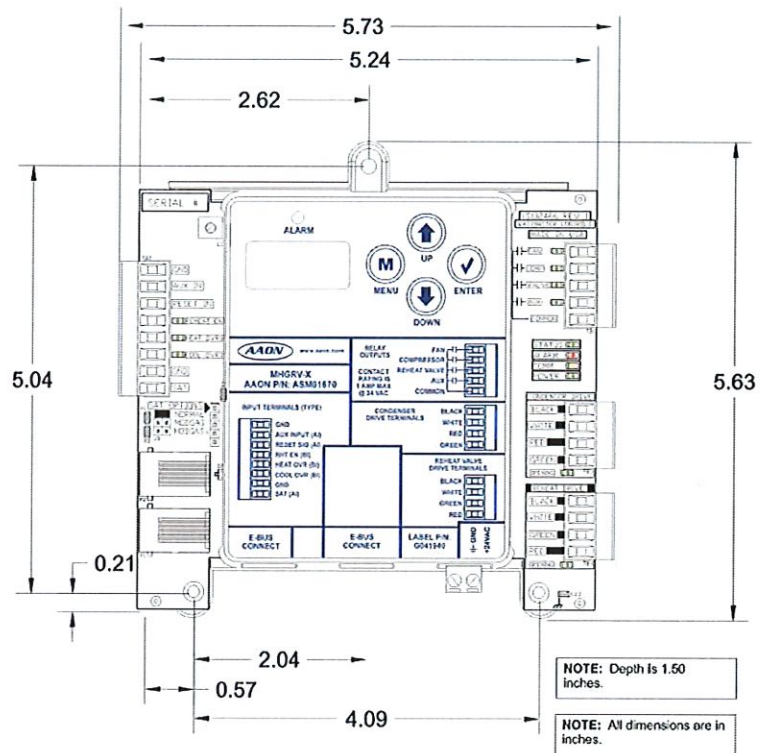
ASM01670 ALT-REF number OE377-26-00059

Description

The MHGRV-X Controller is designed to control a Modulating Hot Gas Reheat Valve to maintain a desired Supply Air Temperature during Dehumidification. The controller can be used as a stand-alone controller or it can be connected to and used in conjunction with the AAON Factory Packaged HVAC unit controller. The MHGRV-X controller is connected to the HVAC unit controller via a modular expansion cable and corresponding connectors on the controllers.

Additional Features

- Can Be Operated as a Stand-Alone Controller or Integrated with the HVAC Unit Controller
- Provides for Supply Air Temperature Setpoint Reset When Required
- Second Stage Reheat Capability When Using 2 Hot Gas Reheat Valves
- Control of Reheat Solenoid Valve to Provide Coil Flushing for Positive Refrigerant Oil Return
- Contains a 2 x 8 LCD character display and 4 buttons that allow for status display, setpoint changes, and configuration changes.



Mounting

The MHGRV-X Controller is housed in a plastic enclosure. It is designed to be mounted by using the 3 mounting holes in the enclosure base. It is important to mount the module in a location that is free from extreme high or low temperatures, moisture, dust, and dirt. Be careful not to damage the electronic components when mounting the module.

Technical Data		MHGRV-X Controller	
Operating Power	18-30 VAC	Power Consumption	18 VA Maximum
Operating Temp	-30°F to 150°F	Operating Humidity	0-95% RH Non-Condensing
Communications	E-BUS	Weight	1 lb.
One Year Warranty		AAON reserves the right to change specifications without notice	



Heating & Cooling Products

CommLink 5

ASM01874 ALT-REF number OE361-13

Description

The CommLink 5 Communications Interface allows computer access into the AAON controls system and also provides communications across multiple local communications loops on the control system.

The CommLink 5 comes packaged in an attractive beige colored plastic enclosure. The CommLink 5 is powered by a small plug-in transformer that is included.

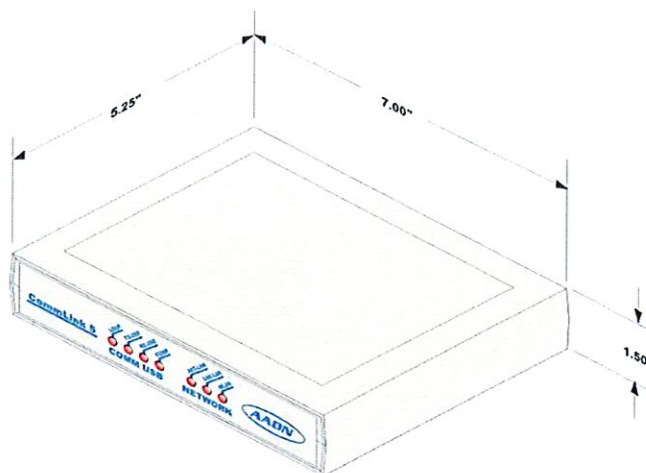
Locally, an on-site personal computer with Prism 2 software installed may be connected to the CommLink 5 to provide direct access to system control parameters. A USB cable (6 ft. long) is provided with the CommLink 5 for connection to your computer.

An optional IP Module Kit, when installed and configured in the CommLink 5 communication interface, provides TCP IP Internet and/or intranet connection for Ethernet networked computer systems, allowing them to communicate with your control system. The IP Module Kit consists of the IP Module and a 10 ft. long CAT5 Ethernet crossover cable.

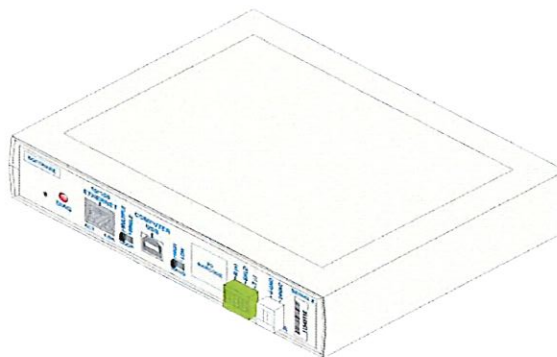
Using standard TCP/IP Protocol with Prism 2 software, you are able to monitor and configure your controllers without a modem or a direct connection from a PC. Utilizing existing routers, proxies, or firewalls allows a PC running Prism 2 to connect to a controller in a remote accessible location or building. Several IP connection profiles can be created to facilitate monitoring several CommLink 5's with IP Module Kits installed on individual sites.

Mounting

If an on-site computer is to be used for direct connection and monitoring of the system, the CommLink 5 should be located near the computer terminal to monitor the system.



Front View



Back View

Technical Data		CommLink 5 Communication Interface	
Power	18-30 Volt AC	*Ethernet Conn.	RJ-45 Ethernet Port
Plug-in Transformer	120V to 24VAC (Included)	Local Loop	RS-485 – 9600 Baud
Power Consumption	14 VA Maximum	Network Loop	RS-485 –19,200 or 57,600 Baud
Operating Temperature	10°F to 140°F	Protocol	HSI Open Protocol Token Passing
Operating Humidity	0-95% RH Non-Condensing	Cabling Included	(1) 6 Ft. Long USB Cable
Computer Conn.	USB Version 1.1 or 2.0		
One Year Warranty		AAON reserves the right to change specifications without notice	



Heating & Cooling Products

IP Module Kit

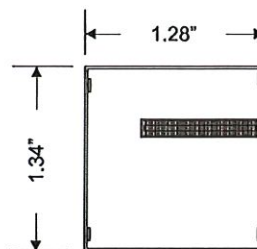
ASM01902 ALT-REF number OE415-02

Description

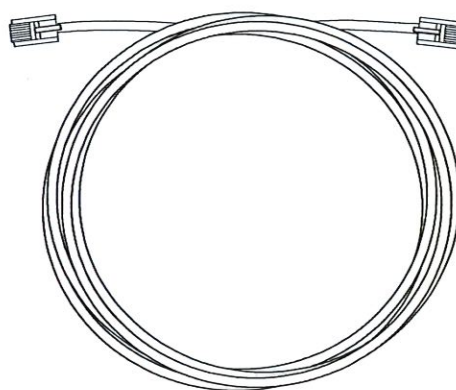
The IP Module Kit (when installed and configured in CommLink 5 communication interface) provides TCP/IP Internet and/or intranet connection for Ethernet networked computer systems allowing them to communicate with your control system. The IP Module Kit consists of the IP Module and a 10 ft. long CAT5 Ethernet crossover cable.

The IP Module plugs into a mating 40 pin (2 x 20) connector located on the CommLink's circuit board. Installation is easily accomplished by removing the CommLink's case cover screws, removing the case cover to access the circuit board, and then plugging the IP Module into its mating socket connector. Correct alignment is made easy because of the (4) slot alignment tabs located around the perimeter of the processor base. It is not possible to incorrectly align the IP Module to the socket connector because of this feature.

The TCP/IP connection provided by the IP Module installed in the CommLink is a TCP connection on a single port number and is static in nature. Firewall and proxy servers can easily be configured to allow traffic to and from the CommLink when the IP Module is installed. The nature of the data is raw in form and comprised of packets native to Prism 2 software. The IP Module will respond to ICMP traffic (PING) for verification of proper configuration. Prism 2 software is required in order to read and send data to the IP Module and through the CommLink to the control system.



IP Module



CAT5 Ethernet Cable

The IP Module connects to the host Ethernet system by means of the supplied 10 ft. long CAT 5 Ethernet crossover cable which plugs into the 10/100 Base-T, RJ-45 jack on the back of the CommLink and into an Ethernet router or Ethernet modem on your building's LAN. Setup of the CommLink with the IP Module requires a knowledgeable IT person familiar with configuring network adapters and TCP/IP systems. Prism 2 software must be installed on the local LAN computer(s) and/or remote Internet computers that will be used to program and monitor the control system.

Technical Data		IP Module Kit	
Operating Temperature	10°F to 140°F	Media Access	CSMA/CD with ACK
Operating Humidity	0-95% RH Non-Condensing	Network Connection	10/100 Base-T Ethernet RJ-45 MDI Socket
Protocols Supported	ARP, UDP, TCP, Telnet, ICMP, SNMP, DHCP, BOOTP, Auto IP, HTTP, SMTP, TFTP	Flow Control	XON/XOFF (Software), CTS/RTS (Hardware), None
Network Interface	IEEE 802.3 RJ45 Ethernet 10BASE-T Or 100BASE-TX (Auto-sensing)	Management	Internal Web Server, SNMP (Read Only), Serial Login, Telnet Login, Device Installer Software
One Year Warranty		AAON reserves the right to change specifications without notice	



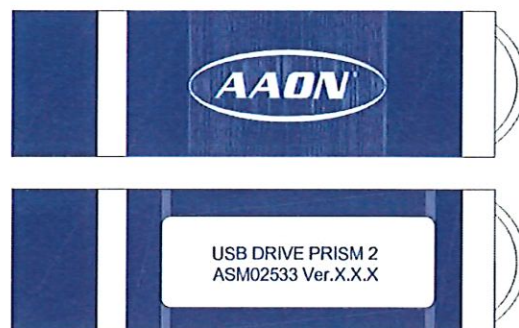
Heating & Cooling Products

Prism 2 Graphical Computer Front End Software

ASM02533 ALT-REF numbers ASM02249 & OE508

Description

Prism 2 is a complete Windows® based graphical interface that allows you to interact with most AAON digital controls systems. The program provides standard, easy-to-understand status, setpoint, and configuration screens for each type of controller and has provisions for custom screens which allow floor plans, equipment photos, or user defined summary screens. Prism 2 allows you to access and control schedules, trend logs, and alarm conditions. The program can be configured for direct on-site installation or TCP/IP Internet connection.



Features

- Easy to use
- On-site or TCP/IP communications
- User-programmable description for every piece of equipment and user-defined custom screens
- Automatic retrieval of trend logs and export capability to spreadsheet and database programs
- Alarm Logs maintained on disk and Alarm E-mail capability
- Encrypted History Logs

System Requirements

To use Prism 2, you must have a computer that meets or exceeds the following requirements:

Operating System

- Microsoft® Windows® 10
- NOTE:** Prism 2 is not intended for a client/server environment nor for any version of Windows® Server.

Minimum Hardware

- Windows® compatible computer
- CommLink 5 or USB Link 2 for direct, on-site connection
- IP Module for remote connection
- **Prism is NOT supported in a server environment. It does not support client/server systems. Prism is a LAPTOP/DESKTOP ONLY system.**

Prism 2 is available on a flash drive or can be downloaded for free from the AAON web site at www.aaon.com/prism. Prism 2 does not require any license agreement and may be freely copied and distributed.

WARNING: Older operating systems, while they still might be capable of running Prism, are not recommended due to security updates being obsoleted by Microsoft®. We also do not support troubleshooting of any version of Windows® operating the Prism program. Some new models of laptops running the latest release of Windows® 10 have also experienced issues running Prism, and we cannot troubleshoot customer computer issues.



Heating & Cooling Products

E-BUS Digital Room Temperature Sensor

ASM01819 ALT-REF number OE217-02

Description

The Touch Screen E-BUS Digital Room Temperature Sensor is used to sense Space Temperature only. The Space Temperature Sensor can be used with the VCCX2, VCB-X, VAV/Zone, and various other AAON Unit Controllers.

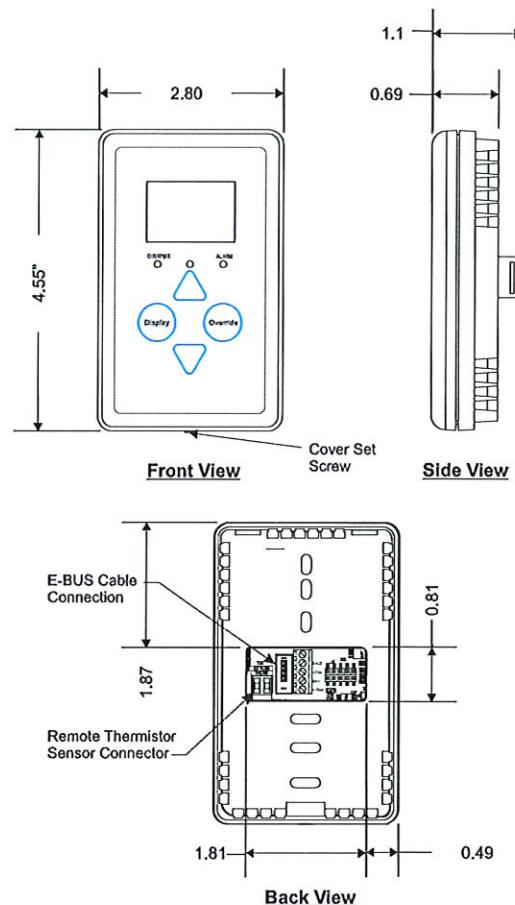
Additional Features

- User Friendly Graphical LCD Display with LED Backlight
- Display the Current Space and Outdoor Air Temperature
- Display the current Zone Setpoint Temperature
- Equipped with Push Buttons for Changing the Zone Setpoint Temperature
- Equipped with an Override Button for Forcing the Unit Controller or VAV/Zone Controller into Occupied Operation from Unoccupied Operation
- Provides graphics to indicate the mode of operation
- Provides LEDs to indicate Schedule Override, Button Push, and Alarms

The sensor connects to the controllers using E-BUS cables of multiple lengths connected between the controller and the sensor. The E-BUS cables should not run in conduit with other AC line voltage wiring or with any conductors carrying highly inductive loads.

Mounting

The E-BUS Digital Room Temperature Sensor is designed to be mounted to a vertical, 2" x 4" electrical box recessed in the wall. If the wall cannot be penetrated, a plastic surface mount box such as those made by Wiremold™, may be used to mount the sensor to the wall surface. The Sensor is mounted by removing the front cover and fastening the housing base to the electrical box using the supplied (2) 6-32" x 1" machine screws. The E-BUS cable is then plugged into the E-BUS connector located on the circuit board that is mounted on the cover. The cover is then placed onto the housing base and the Allen Screw on the bottom of the base is adjusted to hold the cover in place.



Technical Data		E-BUS Digital Room Temperature Sensor	
Sensor Element	Digital Sensing Device	Display	112 x 64 Monochrome Graphical LCD w/LED Backlight
Sensor Reading Range	40°F to 120°F	Connection	E-BUS
Ambient Temperature Limits	-40°F to 180°F	Weight	3.2 oz.
Accuracy	Temp +/- .8°F		
One Year Warranty		AAON reserves the right to change specifications without notice	



Heating & Cooling Products

E-BUS Digital Room Temperature & Humidity Sensor (No LCD Display)

ASM02221 ALT-REF number OE217-04

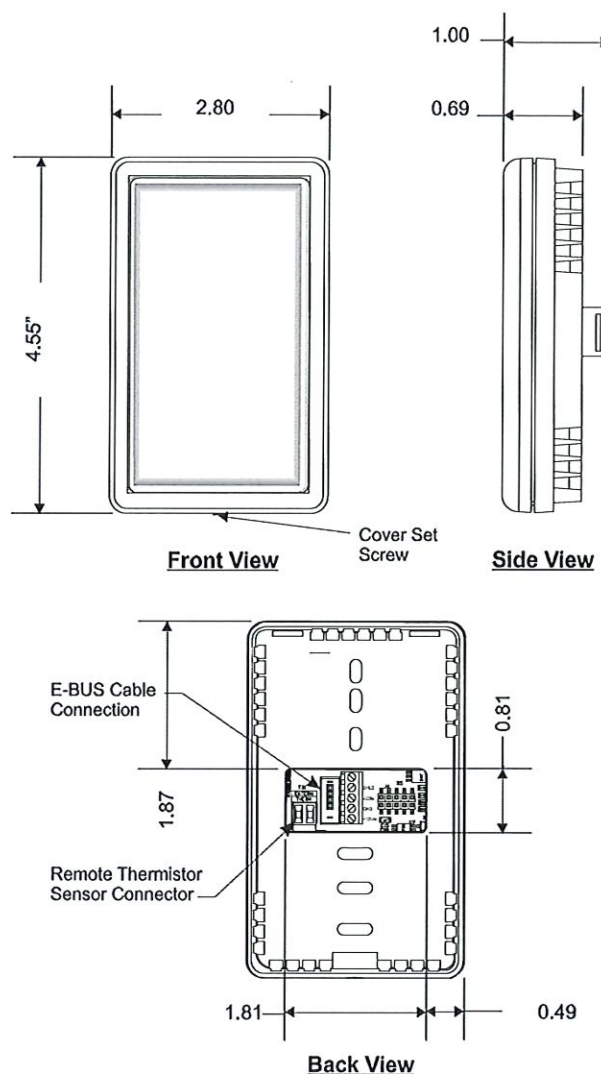
Description

The E-BUS Digital Room Space & Humidity Sensor is used to sense Space Temperature & Space Humidity. The E-BUS Digital Room Sensor can be used with the VCCX2, VCB-X, or various other AAON Unit Controllers.

The E-BUS Digital Room Sensor connects to the controller using E-BUS cables of multiple lengths connected between the controller and the sensor. The E-BUS cables should not run in conduit with other AC line voltage wiring or with any conductors carrying highly inductive loads.

Mounting

The E-BUS Digital Room Sensor is designed to be mounted to a vertical, 2" x 4" electrical box recessed in the wall. If the wall cannot be penetrated, a plastic surface mount box such as those made by Wiremold™, may be used to mount the sensor to the wall surface. The Sensor is mounted by removing the front cover and fastening the housing base to the electrical box using the supplied (2) 6-32" x 1" machine screws. The E-BUS cable is then plugged into the E-BUS connector located on the circuit board that is mounted on the cover. The cover is then placed onto the housing base and the Allen Screw on the bottom of the base is adjusted to hold the cover in place.



Technical Data		E-BUS Digital Room Temperature & Humidity Sensor (No LCD)	
Sensor Element	Digital Sensing Device	Accuracy	RH +/- 3%, Temp +/- .8°F
Sensor Reading Range	40°F to 120°F RH = 0-100%	Connection	E-BUS
Ambient Temperature Limits	-40°F to 180°F	Weight	3.2 oz.
One Year Warranty		AAON reserves the right to change specifications without notice.	



Heating & Cooling Products

E-BUS Return Air Temperature & Humidity Sensor

ASM01840 ALT-REF number OE265-17

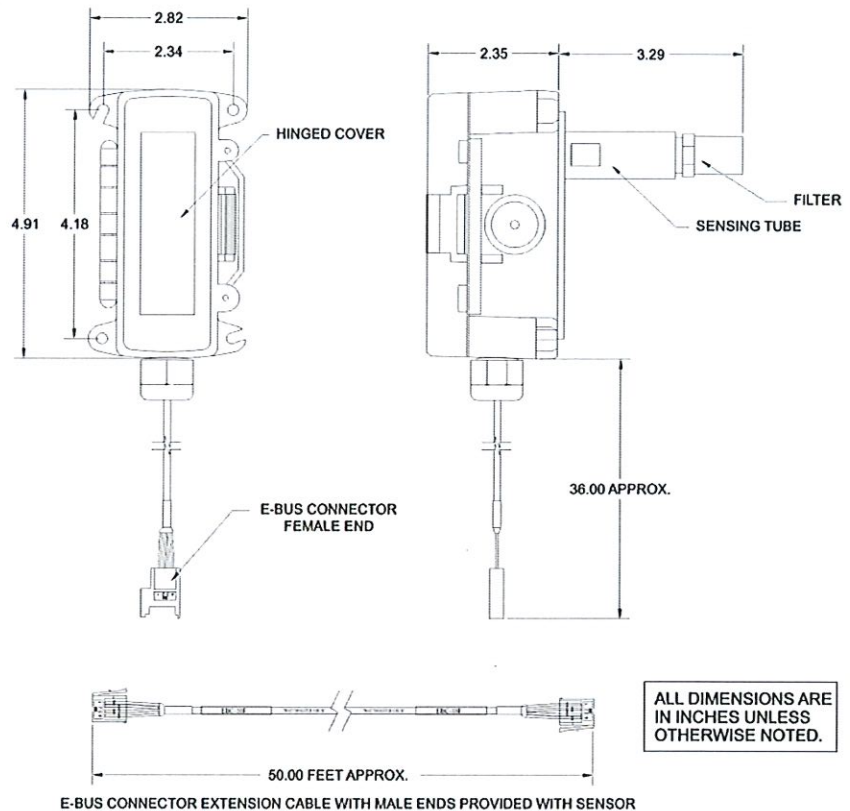
Description

The E-BUS Return Air Temperature and Humidity Sensor is a combination Return Air Temperature and Return Air Humidity sensor that connects to the VCCX2, VCB-X, and various other AAON Unit Controllers using an EBC E-BUS modular cable.

This sensor is used when both Return Air Temperature and Return Air Humidity are needed for the Unit Controller. The Return Air Humidity Sensor can be used to initiate dehumidification based on an Indoor Humidity Setpoint.

Mounting

A 50 foot EBC E-BUS cable (provided) plugs into the E-BUS Return Air Temperature and Humidity Sensor's attached 3-foot cable and then attaches to an E-BUS Expansion port on the Unit Controller or into another available E-BUS Expansion port.



Technical Data		E-BUS Return Air Temperature & Humidity Sensor	
Sensor Element	Digital Capacitive Sensing Device	Accuracy	RH +/- 3%, Temp +/- .8°F
Sensor Reading Range	-40°F to 185°F RH = 0-100%	Connection	E-BUS
Ambient Temperature Limits	-40°F to 185°F	Weight	2.3 oz.
One Year Warranty		AAON reserves the right to change specifications without notice	

**Heating & Cooling Products**

EBC E-BUS Cables

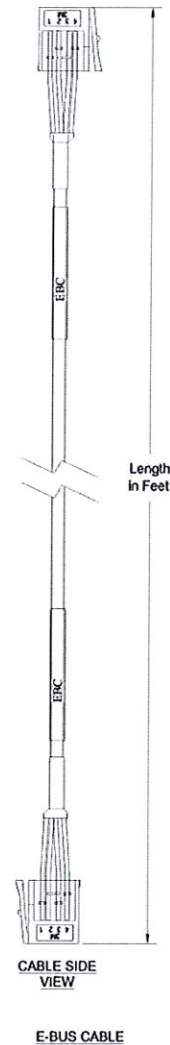
P/N: VARIES ALT-REF number EBC-XXF

Description

The EBC E-BUS Cables are used to connect power and communications between the VCCX2, VCB-X, various other AAON Unit Controllers, E-BUS Modules, and E-BUS Sensors.

The EBC E-BUS Cables are plenum-rated high flex wire cables with an EBC Connector on each end of the cable. The EBC E-BUS Cables are available in 1.5, 3, 10, 25, 50, 75, 100, 150, and 250 foot lengths and additionally a 1000-foot-long spool. These lengths should satisfy most job requirements. For length requirements other than those listed, the E-BUS Adapter Hub can be used to connect EBC E-BUS Cables together to provide for your specific-length requirements.

The plug-in design of the EBC E-BUS Cables eliminates costly wiring errors and makes system installation easy. The cable components are all UL approved.



Technical Data		EBC E-BUS Cables	
EBC E-BUS Cable Available Lengths and Part Numbers	G029440 (1.5 Foot) G012870 (3 Foot) G029460 (10 Foot) G045270 (25 Foot) G029510 (50 Foot) G029530 (75 Foot) G029450 (100 Foot) G029470 (150 Foot) V36590 (250 Foot) G018870 (1000 Foot)	Current Rating of Cable Wire	300 Vrms Min = 10.15 Ohms per 1000 feet @ 20 Deg Celsius, Nominal
Cable Type	Plenum-rated High Flex Wire	Wire Colors	Red/Black First Pair; White/Blue Second Pair
Wire Size	19 Strands of 32 Gage Wire, 4 Conductor	UL Listing No.	CMP/CL3P/FPLP
Terminations	Cable – 2 EBC Connectors	Cable Sheath Color	White, Plenum Rated CL3P/CMP
One Year Warranty		AAON reserves the right to change specifications without notice	