



Public Utilities Commission

Application to Commit
Energy Efficiency/Peak Demand
Reduction Programs
(Mercantile Customers Only)

Case No.: 13-0901-EL-EEC

Mercantile Customer: Clark State Community College

Electric Utility: Ohio Edison Company

Program Title or
Description: Installation in new construction

Rule 4901:1-39-05(F), Ohio Administrative Code (O.A.C.), permits a mercantile customer to file, either individually or jointly with an electric utility, an application to commit the customer's existing demand reduction, demand response, and energy efficiency programs for integration with the electric utility's programs. The following application form is to be used by mercantile customers, either individually or jointly with their electric utility, to apply for commitment of such programs in accordance with the Commission's pilot program established in Case No. 10-834-EL-POR

Completed applications requesting the cash rebate reasonable arrangement option (Option 1) in lieu of an exemption from the electric utility's energy efficiency and demand reduction (EEDR) rider will be automatically approved on the sixty-first calendar day after filing, unless the Commission, or an attorney examiner, suspends or denies the application prior to that time. Completed applications requesting the exemption from the EEDR rider (Option 2) will also qualify for the 60-day automatic approval so long as the exemption period does not exceed 24 months. Rider exemptions for periods of more than 24 months will be reviewed by the Commission Staff and are only approved up the issuance of a Commission order.

Complete a separate application for each customer program. Projects undertaken by a customer as a single program at a single location or at various locations within the same service territory should be submitted together as a single program filing, when possible. Check all boxes that are applicable to your program. For each box checked, be sure to complete all subparts of the question, and provide all requested additional information. Submittal of incomplete applications may result in a suspension of the automatic approval process or denial of the application.

Any confidential or trade secret information may be submitted to Staff on disc or via email at ee-pdr@puc.state.oh.us.

Section 1: Mercantile Customer Information

Name: Clark State Community College

Principal address: 570 East Leffel Lane, Springfield, OH 45501

Address of facility for which this energy efficiency program applies: 275 South Limestone Street, Springfield, OH 45506

Name and telephone number for responses to questions: Neil Wittberg: 614.949.5616

Electricity use by the customer (check the box(es) that apply):

- ☐ The customer uses more than seven hundred thousand kilowatt hours per year at the above facility. (Please attach documentation.)
- ☒ The customer is part of a national account involving multiple facilities in one or more states. (Please attach documentation.)

Section 2: Application Information

A) The customer is filing this application (choose which applies):

- ☐ Individually, without electric utility participation.
- ☒ Jointly with the electric utility.

B) The electric utility is: Ohio Edison Company

C) The customer is offering to commit (check any that apply):

- ☒ Energy savings from the customer's energy efficiency program. (Complete Sections 3, 5, 6, and 7.)
- ☐ Capacity savings from the customer's demand response/demand reduction program. (Complete Sections 4, 5, 6, and 7.)
- ☐ Both the energy savings and the capacity savings from the customer's energy efficiency program. (Complete all sections of the Application.)

Section 3: Energy Efficiency Programs

A) The customer's energy efficiency program involves (check those that apply):

- ☐ Early replacement of fully functioning equipment with new equipment. (Provide the date on which the customer replaced fully functioning equipment, and the date on which the customer would have replaced such equipment if it had not been replaced early. Please include a brief explanation for how the customer determined this future replacement date (or, if not known, please explain why this is not known)). If Checked, Please see Exhibit 1 and Exhibit 2
- ☐ Installation of new equipment to replace equipment that needed to be replaced. The customer installed new equipment on the following date(s): ____.
- ☒ Installation of new equipment for new construction or facility expansion. The customer installed new equipment on the following date(s):
12/3/2011 , 11/30/2011
- ☐ Behavioral or operational improvement.

B) Energy savings achieved/to be achieved by the energy efficiency program:

- 1) If you checked the box indicating that the project involves the early replacement of fully functioning equipment replaced with new equipment, then calculate the annual savings [(kWh used by the original equipment) - (kWh used by new equipment) = (kWh per year saved)]. Please attach your calculations and record the results below:

Annual savings: ____ kWh

- 2) If you checked the box indicating that the customer installed new equipment to replace equipment that needed to be replaced, then calculate the annual savings [(kWh used by less efficient new equipment) - (kWh used by the higher efficiency new equipment) = (kWh per year saved)]. Please attach your calculations and record the results below:

Annual savings: ____ kWh

Please describe any less efficient new equipment that was rejected in favor of the more efficient new equipment. Please see Exhibit 1 if applicable

- 3) If you checked the box indicating that the project involves equipment for new construction or facility expansion, then calculate the annual savings [(kWh used by less efficient new equipment) – (kWh used by higher efficiency new equipment) = (kWh per year saved)]. Please attach your calculations and record the results below:

Annual savings: 174,928 kWh

Please describe the less efficient new equipment that was rejected in favor of the more efficient new equipment. Please see Exhibit 1 if applicable

- 4) If you checked the box indicating that the project involves behavioral or operational improvements, provide a description of how the annual savings were determined.

Section 4: Demand Reduction/Demand Response Programs

A) The customer's program involves (check the one that applies):

- ☐ Coincident peak-demand savings from the customer's energy efficiency program.
- ☐ Actual peak-demand reduction. (Attach a description and documentation of the peak-demand reduction.)
- ☐ Potential peak-demand reduction (check the one that applies):
 - ☐ The customer's peak-demand reduction program meets the requirements to be counted as a capacity resource under a tariff of a regional transmission organization (RTO) approved by the Federal Energy Regulatory Commission.
 - ☐ The customer's peak-demand reduction program meets the requirements to be counted as a capacity resource under a program that is equivalent to an RTO program, which has been approved by the Public Utilities Commission of Ohio.

B) On what date did the customer initiate its demand reduction program?

C) What is the peak demand reduction achieved or capable of being achieved (show calculations through which this was determined):

_____ kW

Section 5: Request for Cash Rebate Reasonable Arrangement (Option 1) or Exemption from Rider (Option 2)

Under this section, check the box that applies and fill in all blanks relating to that choice.

Note: If Option 2 is selected, the application will not qualify for the 60-day automatic approval. All applications, however, will be considered on a timely basis by the Commission.

A) The customer is applying for:

☒ Option 1: A cash rebate reasonable arrangement.

OR

☐ Option 2: An exemption from the energy efficiency cost recovery mechanism implemented by the electric utility.

OR

☐ Commitment payment

B) The value of the option that the customer is seeking is:

Option 1: A cash rebate reasonable arrangement, which is the lesser of (show both amounts):

☒ A cash rebate of \$7,088 (Rebate shall not exceed 50% project cost. Attach documentation showing the methodology used to determine the cash rebate value and calculations showing how this payment amount was determined.)

Option 2: An exemption from payment of the electric utility's energy efficiency/peak demand reduction rider.

☐ An exemption from payment of the electric utility's energy efficiency/peak demand reduction rider for _____ months (not to exceed 24 months). (Attach calculations showing how this time period was determined.)

OR

☐ A commitment payment valued at no more than \$____. (Attach documentation and calculations showing how this payment amount was determined.)

OR

- ☐ Ongoing exemption from payment of the electric utility's energy efficiency/peak demand reduction rider for an initial period of 24 months because this program is part of the customer's ongoing efficiency program. (Attach documentation that establishes the ongoing nature of the program.) In order to continue the exemption beyond the initial 24 month period, the customer will need to provide a future application establishing additional energy savings and the continuance of the organization's energy efficiency program.)

Section 6: Cost Effectiveness

The program is cost effective because it has a benefit/cost ratio greater than 1 using the (choose which applies):

- ☐ Total Resource Cost (TRC) Test. The calculated TRC value is: _____(Continue to Subsection 1, then skip Subsection 2)
- ☒ Utility Cost Test (UCT) . The calculated UCT value is: See Exhibit 3 (Skip to Subsection 2.)

Subsection 1: TRC Test Used (please fill in all blanks).

The TRC value of the program is calculated by dividing the value of our avoided supply costs (generation capacity, energy, and any transmission or distribution) by the sum of our program overhead and installation costs and any incremental measure costs paid by either the customer or the electric utility.

The electric utility's avoided supply costs were _____.

Our program costs were _____.

The incremental measure costs were _____.

Subsection 2: UCT Used (please fill in all blanks).

We calculated the UCT value of our program by dividing the value of our avoided supply costs (capacity and energy) by the costs to our electric utility (including administrative costs and incentives paid or rider exemption costs) to obtain our commitment.

Our avoided supply costs were See Exhibit 3

The utility's program costs were See Exhibit 3

The utility's incentive costs/rebate costs were See Exhibit 3

Section 7: Additional Information

Please attach the following supporting documentation to this application:

- Narrative description of the program including, but not limited to, make, model, and year of any installed and replaced equipment.
- A copy of the formal declaration or agreement that commits the program or measure to the electric utility, including:
 - 1) any confidentiality requirements associated with the agreement;
 - 2) a description of any consequences of noncompliance with the terms of the commitment;
 - 3) a description of coordination requirements between the customer and the electric utility with regard to peak demand reduction;
 - 4) permission by the customer to the electric utility and Commission staff and consultants to measure and verify energy savings and/or peak-demand reductions resulting from your program; and,
 - 5) a commitment by the customer to provide an annual report on your energy savings and electric utility peak-demand reductions achieved.
- A description of all methodologies, protocols, and practices used or proposed to be used in measuring and verifying program results. Additionally, identify and explain all deviations from any program measurement and verification guidelines that may be published by the Commission.



Public Utilities Commission

Application to Commit
Energy Efficiency/Peak Demand
Reduction Programs
(Mercantile Customers Only)

Case No.: 13-0901-EL-EEC

State of Ohio :

Joe Jackson, Affiant, being duly sworn according to law, deposes and says that:

1. I am the duly authorized representative of:

Clark State Community College

[insert customer or EDU company name and any applicable name(s) doing business as]

2. I have personally examined all the information contained in the foregoing application, including any exhibits and attachments. Based upon my examination and inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete.


Signature of Affiant & Title

VP Business Affairs

Sworn and subscribed before me this 21 day of May, 2013 Month/Year


Signature of official administering oath
David R. Farrell

Joe Jackson - VP for Business Affairs
Print Name and Title

My commission expires on 9-17-2013



199 E WASHINGTON ST SPRINGFIELD OH 45502

FES-G960 12/21/2012 01/23/2013

OE-GSD 12/21/2012 01/23/2013

ACCTS PAYABLE 303 S FOUNTAIN AVE SPRINGFIELD OH

FES-G960 12/18/2012 01/21/2013

FES-G960 01/22/2013 02/18/2013

OE-GSD 12/18/2012 01/21/2013

OE-GSD 01/22/2013 02/18/2013

290 S LIMESTONE ST SPRINGFIELD OH 45502

FES-8098 12/21/2012 01/23/2013

OE-GSD 12/21/2012 01/23/2013

ACCTS PAYABLE 300 S FOUNTAIN AVE PMP SPRINGFIELD

FES-G960 12/18/2012 01/21/2013

OE-GSD 12/18/2012 01/21/2013

100 S LIMESTONE ST SPRINGFIELD OH 45502

FES-8075 12/28/2012 01/29/2013 \$

FES-8125 12/28/2012 01/29/2013 \$

OE-GSD 12/28/2012 01/29/2013 \$

OE-POLSF 12/28/2012 01/29/2013

650 E AUBURN AVE SPRINGFIELD OH 45505

FES-8068 01/12/2013 02/11/2013

OE-GSD 01/12/2013 02/11/2013

ACCTS PAYABLE 350 S FOUNTAIN AVE SPRINGFIELD OH

FES-8070 12/18/2012 01/21/2013

OE-GSD 12/18/2012 01/21/2013

OE-POLSF 12/18/2012 01/21/2013

ACCTS PAYABLE 300 S FOUNTAIN AVE TES SPRINGFIELD

FES-8122 01/16/2013 02/13/2013 \$

OE-GSD 01/16/2013 02/13/2013 \$

OE-GSF 01/16/2013 02/13/2013 \$

570 E LEFFEL LN SPRINGFIELD OH 45505

FES-8086 01/16/2013 02/13/2013 \$11

OE-GTD 01/16/2013 02/13/2013 \$

OE-POLSF 01/16/2013 02/13/2013

Customer Legal Entity Name: Clark State Community College

Site Address: Clark State Community College

Principal Address: 275 South Limestone Street

Project No.	Project Name	Narrative description of your program including, but not limited to, make, model, and year of any installed and replaced equipment:	Description of methodologies, protocols and practices used in measuring and verifying project results	What date would you have replaced your equipment if you had not replaced it early? Also, please explain briefly how you determined this future replacement date.	Please describe the less efficient new equipment that you rejected in favor of the more efficient new equipment.
1	Energy Efficient Lighting	Installation of new lighting fixtures and occupancy sensors in new construction of the Performing Arts Center expansion at Clark State Community College.	Lights were counted off of the plans and input to the lighting countsheet (see attachment A: OE.ClarkStateCC.LightingCountsheets.AttachmentA). This data was input to the FE lighting rebate calculator to determine the cash rebate and the kWh savings.	N/A	N/A
2	Energy Efficient HVAC equipment	Three new rooftop units were installed as part of this facility expansion as well as 2 new ductless mini split air conditioners.	Information was gathered from the mechanical plans (OE.ClarkStateCC.PerformingArts.MechSchedule.AttachmentE) and submittals (OE.ClarkStateCC.PerformingArts.Submittals.AttachmentF) and input to the FE HVAC calculator to calculate the kWh savings and the cash rebate amount.	N/A	N/A
3	Demand Controlled Ventilation	CO2 sensors were installed on the three new RTU's to regulate the outside air damper based on zone occupancy/CO2 levels.	kWh savings were calculated using binned weather data for Dayton, OH and calculating cooling savings resulting from the reduced amount of outdoor air, necessary to ventilate the space. This calculation is shown in attachment D: OE.ClarkStateCC.DCVSavings.AttachmentD. This kWh amount was input to the custom rebate calculator to determine the cash rebate amount.	N/A	N/A
4	Variable Frequency Drives	Variable Frequency Drives were installed on 3 new rooftop units in the facility.	Data was gathered from the mechanical schedules and input into the motor and drives rebate calculator to determine the cash rebate amount. kWh savings were calculated based on approximate runtimes for the different motor applications (see attachment B: OE.ClarkStateCC.P4Calcs.AttachmentB.xls).	N/A	N/A

Exhibit 2

Customer Legal Entity Name: Clark State Community College

Site Address: Clark State Community College

Principal Address: 275 South Limestone Street

	Unadjusted Usage, kwh (A)	Weather Adjusted Usage, kwh (B)	Weather Adjusted Usage with Energy Efficiency Addbacks, kwh (c) <i>Note 1</i>
2011	365,440	365,440	380,450
Average	365,440	365,440	380,450

Project Number	Project Name	In-Service Date	Project Cost \$	50% of Project Cost \$	KWh Saved/Year (D) counting towards utility compliance	KWh Saved/Year (E) eligible for incentive	Utility Peak Demand Reduction Contribution, KW (F)	Prescriptive Rebate Amount (G) \$	Eligible Rebate Amount (H) \$ <i>Note 2</i>
1	Energy Efficient Lighting	11/30/2011	\$109,401	\$54,701	135,269	135,269	-	\$5,564	\$4,173
2	Energy Efficient HVAC equipment	12/03/2011	\$31,683	\$15,842	9,645	9,645	-	\$1,350	\$1,013
3	Demand Controlled Ventilation	12/03/2011	\$1,950	\$975	14,445	14,445	-	\$1,156	\$867
4	Variable Frequency Drives	12/03/2011	\$2,775	\$1,388	15,569	15,569	-	\$1,380	\$1,035
					-	-	-		
					-	-	-		
					-	-	-		
	Total		\$145,809		174,928	174,928	0	\$9,450	\$7,088

Docket No. 13-0901

Site: 275 South Limestone Street

Notes

(1) Customer's usage is adjusted to account for the effects of the energy efficiency programs included in this application. When applicable, such adjustments are prorated to the in-service date to account for partial year savings.

(2) The eligible rebate amount is based upon 75% of the rebates offered by the FirstEnergy Commercial and Industrial Energy Efficiency programs or 75% of \$0.08/kWh for custom programs for all energy savings eligible for a cash rebate as defined in the PUCO order in Case NO.10-834-EL-EEC dated 9/15/2010, not to exceed the lesser of 50% of the project cost or \$250,000 per project. The rebate also cannot exceed \$500,000 per customer per year, per utility service territory.

Commitment
Payment
\$



\$0

Exhibit 3 Utility Cost Test

UCT = Utility Avoided Costs / Utility Costs

Project	Total Annual Savings, MWh (A)	Utility Avoided Cost \$/MWh (B)	Utility Avoided Cost \$ (C)	Utility Cost \$ (D)	Cash Rebate \$ (E)	Administrator Variable Fee \$ (F)	Total Utility Cost \$ (G)	UCT (H)
1	135	\$ 308	\$ 41,701	\$ 1,013	\$4,173	\$1,353	\$ 6,538	6.4
2	10	\$ 308	\$ 2,973	\$ 1,013	\$1,013	\$96	\$ 2,121	1.40
3	14	\$ 308	\$ 4,453	\$ 1,013	\$867	\$144	\$ 2,024	2.20
4	16	\$ 308	\$ 4,800	\$ 1,013	\$1,035	\$156	\$ 2,203	2.18
Total	175	\$ 308	53,927	4,050	\$7,088	\$1,749	12,887	4.2

Notes

- (A) From Exhibit 2, = kWh saved / 1000
- (B) This value represents avoided energy costs (wholesale energy prices) from the Department of Energy, Energy Information Administration's 2009 Annual Energy Outlook (AEO) low oil prices case. The AEO represents a national average energy price, so for a better representation of the energy price that Ohio customers would see, a Cinergy Hub equivalent price was derived by applying a ratio based on three years of historic national average and Cinergy Hub prices. This value is consistent with avoided cost assumptions used in EE&PDR Program Portfolio and Initial Benchmark Report, filed Dec 15, 2009 (See Section 8.1, paragraph a).
- (C) = (A) * (B)
- (D) Represents the utility's costs incurred for self-directed mercantile applications for applications filed and applications in progress. Includes incremental costs of legal fees, fixed administrative expenses, etc.
- (E) This is the amount of the cash rebate paid to the customer for this project.
- (F) Based on approximate Administrator's variable compensation for purposes of calculating the UCT, actual compensation may be less.
- (G) = (D) + (E) + (F)
- (H) = (C) / (G)

Clark State Community College ~ Clark State Community College
Docket No. 13-0901

Site: 275 South Limestone Street

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Applicant Name:	Clark State Community College
Facility Name:	Performing Arts Center
5-digit Zip Code:	45505
Region:	Dayton
Date:	4.11.2013

Proposed equipment efficiencies must be greater than or equal to the minimum rated efficiencies shown on this form.

Please consider the chiller options carefully, as they depend on air-side technology.

[illegible]

Applicant Name:	Clark State Community College
Facility Name:	Performing Arts Center
5-digit Zip Code:	45505
Region:	Dayton
Date:	4.11.2013

noted below. Your equipment manufacturer or vendor should be able to provide these rated performance results.

[illegible]

Project Estimated Annual Savings Summary

HVAC

Estimated Annual kWh Savings	9,645
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Total Demand Savings (kW)	7.58
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Annual Estimated Cost Savings	\$964.47
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Total Calculated Incentive	\$1,350.00
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Lighting Form

Lighting Inventory Form

Applicant Name: _____

Facility Name: _____

Date: _____

Lighting Zone (interior only): _____ Lighting Zone 3

Instructions: Please use one line for each fixture type in a room or area.

For existing or proposed control, choose CCC for Occupancy Sensor, DAYLGT for photosensor, or NONE for none. Controls must save energy to qualify.

The total of Column S, the quantiles of CFLs and exit signs in Column M, and the quantiles of sensors in Column R, will be used to calculate your incentive on the NonStandard Lighting form.

[illegible]

Lighting Form

[illegible]

Note: If your total change in connected load is greater than or equal to 50 kW the cell above will be red. Please see row 4 on the instructions tab for information on adjusting the predominant space type to "Other" and estimating CF and EFLH values.

Project Estimated Annual Savings Summary

Estimated Annual kWh Savings	135,269
Total Change in Connected Load	15.91

Annual Estimated Cost Savings	\$13,526.90
Annual Operating Hours	5,010

Interior Lighting Incentive @ \$0.05/kWh (excluding retrofit CFLs, sensors, or LED exit signs)	\$4,464.00
Exterior Lighting Incentive @ \$0.05/kWh (excluding retrofit CFLs, sensors, or LED exit signs)	\$0.00
Total retrofit CFL Incentive @ \$1/screw-in CFL lamp; \$15/hard-wired CFL lamp (includes all retrofit CFLs, both interior and exterior)	\$0.00
Total retrofit LED Exit Incentive @ \$10/exit sign	\$0.00
Total Lighting Controls Incentive @ \$25/sensor (includes all Lighting Controls, both interior and exterior)	\$1,100.00

Total Calculated Incentive	\$5,564.00
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Total Fixture Quantity excluding retrofit CFLs and LED Exit Sign	1
Total Lamp Quantity for retrofit Screw-In CFLs	0
Total Lamp Quantity for retrofit Hard-Wired CFLs	0
Total Fixture Quantity for retrofit LED Exit Signs	0
Total Quantity for Occupancy Sensors	44
Total Quantity for Daylight Sensors	0

Please briefly describe how you estimated your coincidence factor (CF) and applicant equivalent full-load hours (EFLH) for facility type "Other" indicated on the Lighting Form tab

Demand Savings (For Internal Use Only)

13.65



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Project Name:	Clark State Community College
Site Name:	Performing Arts Center
Completed by (Name):	
Date completed:	4/16/2013

Variable Frequency Drive Rebate Form

VFD and Controlled Motor Nameplate DATA											Total Motor Incentive ¹ \$
Motor Application	VFD Manufacturer	VFD Model Number	Unique Motor ID(s)	Motor Location	Enclosure type: TEFC or ODP	Annual Hours of Operation ²	Load Factor (LF) ³	Motor Model Number	Motor HP	Motor Nominal Efficiency	
Supply Fan			RTU-1		ODP	2,790	0.8		40	94.1	1,200
RTU-2			RTU-2		ODP	2,790	0.8		3	89.5	90
RTU-3			RTU-3		ODP	2,790	0.8		3	89.5	90
Incentive through 10/11/2011 @ \$30/hp											1,380

(1) VFD incentives are calculated at a flat rate of \$30 per horsepower controlled, up to a maximum of 500 hp controlled per VFD.

When a single VFD is used to control two motors in a lead/lag (standby, redundant) configuration, use only the horsepower rating of one motor to figure controlled horsepower. For instance, if a single VFD controls two 30hp motors with only one operating at a time, the incentive calculation should be based on 30 hp: 30hp x \$30/hp = \$900.

(2) For VAV fan motors, enter 2790 annual hours of operation. For HVAC pump motors, enter 5520 annual hours of operation. For all other motor usage, please estimate your annual hours of operation and attach an explanation of how you determined this value.

(3) For all motor and VFD applications, use the Load Factor (LF) default value of 0.80, unless data is available to support the use of a motor-specific LF other than 0.80. Please attach an explanation, including your analysis and/or data used, to support motor-specific LF value.

Clark State Community College - Performing Arts Center

Demand Controlled Ventilation Savings

Attachment D

Total CFM	30000
% OA DESIGN	33%
% OA DCV	5%
Cooling StPt	72
Cooling EER	10.67

Savings

14,445 kWh

\$ 1,155.58 Rebate

\$ 866.68 Rebate at 75%

Dayton Ohio Binned Weather Data

StrTemp	EndTemp	T(F)	Twb(F)	h(Btu/lba)	w(lbw/lba)	hrs1-8	hrs9-16	hrs17-24	hrs1-24	Q(MMBTU)
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	
95	99	95.7	74.3	37.7	0.0134	0	13	3	16	5.49
90	94	92.3	74.9	38.2	0.0146	0	49	19	68	21.57
85	89	87.8	71.9	35.8	0.0134	0	110	43	153	38.58
80	84	82.5	68.6	33.1	0.0121	11	215	124	350	53.70
75	79	77.4	66.2	31.3	0.0117	57	256	175	488	47.93
70	74	72.7	65.5	30.8	0.0122	154	202	231	587	33.31
65	69	68	61.5	28	0.0107	220	248	248	716	15.20
60	64	62.8	56.7	24.7	0.0089	319	254	306	879	
55	59	57.7	51.4	21.4	0.007	274	258	253	785	
50	54	52.1	46.8	18.7	0.0058	288	207	238	733	
45	49	47.3	43.4	16.8	0.005	187	161	164	512	
40	44	42.7	39.8	14.8	0.0043	311	209	317	837	
35	39	37.5	36	12.9	0.0036	334	232	227	793	
30	34	32.4	32.1	10.9	0.0029	238	185	170	593	
25	29	27.6	28.2	9	0.0022	164	108	141	413	
20	24	23.1	25.2	7.5	0.0019	140	86	96	322	
15	19	17.8	21.6	5.9	0.0015	86	58	86	230	
10	14	12.8	18.2	4.3	0.0012	49	28	42	119	
5	9	6.9	14.3	2.6	0.0009	44	31	18	93	
0	4	2.4	11.4	1.3	0.0007	19	7	13	39	
-5	-1	-1.2	9	0.3	0.0006	21	3	6	30	
-10	-6	-5.6	6.2	-0.8	0.0005	4	0	0	4	

Client: Clark State Community College

Site: Performing Arts Center

ATTACHMENT A

Date Last Worked On:



Room By Room COMcheck Summary

Area (sq ft)	Allowed Wattage	Proposed Wattage	% Above/Below Code	Watts Saved
27019.71	28753.406	27320.4	⚠ 4.98%	1433.006
Hours of Operation	Electric Rate	kWh Saved	\$ Saved	
0	0	0	0	

Whole Building COMcheck Summary

Building Type	COMcheck Rating			
Performing Theater	1.6			
Area	Allowed Wattage	Proposed Wattage	% Above/Below Code	Watts Saved
27019.71	43231.536	27320.4	✅ 36.80%	15911.136
Hours of Operation	Electric Rate	kWh Saved	\$ Saved	
0	0	0	0	

Occupancy Sensor Summary

Watts Controlled	OS>500W	OS<500W	OS Total	
11882	8	36	44	

Photocell Sensor Summary

Watts Controlled	OS>500W	OS<500W	OS Total	
0	0	0	0	

Room Type	Area	COMcheck Rating	Allowed Wattage	Proposed Wattage
Audience	7093.25	0.9	6383.925	8675
Classroom	6132.73	1.4	8585.822	5201
Conference Room	97.4	1.3	126.62	88
Dining	1189.18	0.9	1070.262	1189
Dorm Room	0	1.1	0	0
Exam/Treatment	0	1.5	0	0
Exercise Area	0	0.9	0	0
Food Prep	702.22	1.2	842.664	906
Gym	0	2.3	0	0
Hall	1930.86	0.5	965.43	2046
Laboratory	0	1.4	0	0
Laundry	0	0.6	0	0
Lobby	2213.55	1.3	2877.615	1472
Locker	0	0.6	0	0
Lounge	783.61	1.2	940.332	348
Mail Sorting	0	1.2	0	0
Mech/Elec	854.46	1.5	1281.69	1119.4
Nurse	0	1	0	0
Office	2451.24	1.1	2696.364	1995
Operating Room	0	2.2	0	0
Parking Garage	0	0.2	0	0
Patient Room	0	0.7	0	0
Pharmacy	0	1.2	0	0
Reading	180	1.2	216	177
Restroom	1061.68	0.9	955.512	1838
Sales Area	0	1.7	0	0
Stacks	0	1.7	0	0
Stairs	1174.17	0.6	704.502	1017
Storage	989.56	0.8	791.648	1036
Workshop	165.8	1.9	315.02	213
Totals	27019.71		28753.406	27320.4

The figure illustrates the structure of the 1000 Genomes Project. It is divided into four main sections. The first section on the left shows a timeline from 2008 to 2015, with vertical lines indicating the release of data. The second section shows a list of populations: African, European, East Asian, South Asian, and Admixed American. The third section shows a list of populations: African, European, East Asian, South Asian, and Admixed American. The fourth section shows a list of populations: African, European, East Asian, South Asian, and Admixed American.

Attachment B

[illegible]

CABINET HEATER SCHEDULE

SYMBOL	MODEL NUMBER	GMA CEN	MOTOR		ELECTRICAL		HEATING				NOTES
			H.P.	RPM	V./HZ.	FLA	MH	GPM	F.D.	L.A.T.	
CH-1,2,3	TRAC F78B 040	610	1/16	1030	120/60/1	1.3	45.6	2.7	8.9	136	12.3,4,5
CH-5	TRAC F78B 040	610	1/16	1030	120/60/1	1.3	45.6	2.7	8.9	136	13,4,5,6
△ CH-1,6,11	TRAC F78B 030	350	1/25	880	120/60/1	0.7	21.0	1.5	8.8	135	13,4,5,6
CH-7	TRAC F78B 040	360	1/25	1050	120/60/1	0.8	23.6	1.7	3.2	135	12,3,4,5,6
CH-8,9,10	TRAC F78B 03	350	1/25	880	120/60/1	0.7	21.0	1.5	8.8	135	12,3,4,5,6

- 1) HEATING COIL CAPACITIES BASED ON 70°F E.A.T., 160°F E.A.T.
- 2) FURNISH UNIT MOUNTED THERMOSTAT INDEXED BY LOCAL WAX BOIL
- 3) FURNISH UNIT WITH FACTORY PIPED VALVE PACKAGE. SEE SHEET H-6
- 4) FURNISH TWO SETS OF FILTERS.
- 5) FURNISH LINE VOLTAGE TAMPER PROOF WALL MOUNTED THERMOSTAT BY E.C.
- 6) FURNISH WITH TAMPER PROOF UNIT MOUNTED FAN SPEED SWITCH.

ROOFTOP A/C UNIT SCHEDULE

SYMBOL	THANE MODEL	SUPPLY CFM	OA CFM	COOLING CAPACITY			EER (SEER)	HEATING CAPACITY		AFUE	BLOWER (HP)	ELECTRICAL	MCA	PERSONAL BREAKER	NOTES
				TYPICAL INT. MBH	SENSIBLE MBH	INPUT		OUTPUT							
RTU-1	SPH70	22,000	8,300	4.77	725	574	10.3	500	410	0.82	40	480V/3	190	225	1,2,3,4,5,6,7,8,9,10
RTU-2	TSC-120EA	4,000	800	1*	118.0	92.7	10.6	COOLING ONLY			3.0	480V/3	26.5	35	1,2,3,4,5,6,7,8,9,10
RTU-3	TSC-120EA	4,000	800	1*	118.0	92.7	10.6	COOLING ONLY			3.0	480V/3	26.5	35	1,2,3,4,5,6,7,8,9,10

- | | |
|---|--|
| 1) FURNISH 14" HIGH ROOF CURB FOR INSTALLATION BY G.C. | 6) MODULATING GAS HEAT. |
| 2) FURNISH TWO SETS OF 2" PLEATED FILTERS. | 7) HIGH CAPACITY EVAPORATOR COIL. |
| 3) FURNISH UNIT WITH TIME-OUT CONTROL. | 8) CO2 SENSOR IN RETURN AIR DUCT TO CONTROL MOTORIZED OUTSIDE AIR DAMPER. |
| 4) FURNISH UNIT WITH DDC CONTROLS. | 9) PROTECT THE CONDENSATE PIPER LINES AND RUN TO NEAREST ROOF DRAIN. INSULATE LINE FOR RTU-1 WITH 1/2" INSULATION WITH 3 COATS OF MANUFACTURER'S WHITE WEATHER FINISH. |
| 5) FURNISH & INSTALL ECONOMIZER WITH POWER EXHAUST AND VFD. | |

FAN POWERED V.A.V. BOX WITH HOT WATER REHEAT - SCHEDULE

FORM	TRNG. MODEL	PUMP DATA	COOLING AIRFLOW	MINIMUM COOLING AIRFLOW	HEATING AIRFLOW	FAN AIRFLOW	TOTAL AIRFLOW	ESTIMATED EXTERNAL S.P.	NEW REGENERATIVE COOL. QPM	MINIMUM RECHG. COOL. P.D.	VELOCITY	FAN AMPS	FAN	NOTES
12-10	VPWF08	8" 600	105	150	400	550	0.3	2	---	277/1	1.6	0.350	12,3,4	
12-10	VPWF08	8" 600	105	150	400	550	0.3	2	---	277/1	1.6	0.350	12,3,4	
12-10	VPWF10	10" 1000	175	200	700	900	0.3	3	---	277/1	1.6	0.350	12,3,4	
12-10	VPWF10	10" 1000	175	200	700	900	0.3	3	---	277/1	1.6	0.350	12,3,4	
12-10	VPWF10	10" 1000	175	200	700	900	0.3	3	---	277/1	1.6	0.350	12,3,4	
12-10	VPWF14	14" 3000	450	500	1500	2000	0.5	4	---	277/1	4.7	0.750	12,3,4	
12-10	VPWF10	10" 1000	165	200	600	800	0.3	2	---	277/1	1.6	0.350	12,3,4	
12-10	VPWF10	10" 1000	175	200	700	900	0.3	2	---	277/1	1.6	0.350	12,3,4	
12-10	VPWF14	14" 2100	325	420	1400	1820	0.4	4	---	277/1	3.8	0.650	12,3,4	
12-10	VPWF12	12" 1600	240	320	1000	1320	0.3	3	---	277/1	2.4	0.650	12,3,4	
12-10	VPWF12	12" 1780	270	320	1100	1420	0.3	3	---	277/1	2.4	0.650	12,3,4	
12-10	VPWF06	6" 400	0	100	300	400	0.3	1	---	277/1	0.7	0.250	12,3,4	
12-10	VPWF10	10" 1200	0	175	800	950	0.4	3	---	277/1	2.0	0.450	12,3,4	
12-10	VPWF12	12" 1600	240	320	1000	1320	0.3	3	---	277/1	2.4	0.650	12,3,4	
12-10	VPWF10	10" 1000	175	200	800	1000	0.4	3	---	277/1	2.0	0.450	12,3,4	
12-10	VPWF12	14" 3000	450	750	1500	2250	0.4	4	---	277/1	4.7	0.750	12,3,4	

- NOTES**
- 1) DDC CONTROLS WITH SPACE SENSOR.
 - 2) ELECTRIC HEATER TO HAVE 24v. MAGNETIC CONTACTOR, AIRFLOW SWITCH, AND DOOR MOUNTED DISCONNECT SWITCH.
 - 3) SLIP AND DRIVE OUTLET DUCT CONNECTION
 - 4) PROVIDE WITH FACTORY ELECTRICAL DISCONNECT.

HOT WATER UNIT HEATER SCHEDULE

SYMBOL	MANUFACTURER & MODEL #	MBH	CFM	ELECTRIC	MOTOR HP	ENT	LAT	GPM	P.D.	NOTES
UH-1	TRANE 18-P	10	380	120/60/1	1/25	180	90°F	1.0	0.17	1.2,3,4
UH-2	TRANE 18-P	10	380	120/60/1	1/25	180	90°F	1.0	0.17	1.2,3,4
UH-3	TRANE 18-P	10	380	120/60/1	1/25	180	90°F	1.0	0.17	1.2,3,4

- | | |
|--|--|
| 1) MOUNT BOTTOM OF UNIT AT 9"-0". | 3) CAPACITIES BASED ON 70°F E.A.T. |
| 2) FURNISH LINE VOLTAGE WALL MOUNTED THERMOSTAT FOR WIRING BY E.C. | 4) FURNISH WITH UNIT MOUNTED DISCONNECT. |

V.A.V. REHEAT BOX SCHEDULE

SYMBOL	TRANE MODEL	INLET DASH	COOLING AMFLOW	MINIMUM COOLING AMFLOW	HEATING AMFLOW	ELECTRIC COOL			NOTES
						VOLTAGE/PHASE	STAGES	KW	
V-1	VCEF 10	10"	700	700	700	277/1	2	3	1,2,3,4
V-2	VCEF 10	10"	700	700	700	277/1	2	3	1,2,3,4

- NOTES:
- | | |
|--|---|
| 1.) DDC CONTROLS WITH SPACE SENSOR. | 3.) SLIP AND DRIVE OUTLET DUCT CONNECTION |
| 2.) ELECTRIC HEATER TO HAVE 24v. MAGNETIC CONTACTOR, AIRFLOW SWITCH, AND DOOR MOUNTED DISCONNECT SWITCH. | 4.) FUSED |

AIR DEVICE SCHEDULE

SYMBOL	FACE SIZE	NOSE SIZE	TITUS MODEL NO.	TOTAL CFW	MOUNTING SURFACE	AIR PATTERN	NOTES
(A)	24"x24"	6"x	QMN	AS NOTED	T-BAR GRID	4-WAY	1,2,3
(B)	24"x24"	6"x	QMN	AS NOTED	T-BAR GRID	4-WAY	1,2,3
(C)	24"x24"	10"x	QMN	AS NOTED	T-BAR GRID	4-WAY	1,2,3
(D)	12"x24"	6"x	QMN	AS NOTED	SURFACE	4-WAY	1,2,4
(E)	24"x24"	6"x	QMN	AS NOTED	SURFACE	4-WAY	1,2,4
(F)	24"x24"	10"x	QMN	AS NOTED	SURFACE	4-WAY	1,2,4
(G)	8" DSG SHEATH, 10" TITUS	12"x12"	FL-10-17	AS NOTED	SURFACE	4-WAY	1,2,4,5
(H)	24"x24"	10"x	TDC	AS NOTED	T-BAR GRID	4-WAY	1,2,4
(I)	24"x24"	22"x22"	350R	AS NOTED	T-BAR GRID	RETURN	1,3
(J)	12"x12"	10"x10"	350R	AS NOTED	SURFACE	RETURN/ EXHAUST	
(K)	16"x8"	14"x8"	300RS	AS NOTED	DUCT MOUNTED	ADL	1,2,4
(L)	14"x8"	12"x8"	300RS	AS NOTED	DUCT MOUNTED	ADL	1,2,4
(M)	8"x8"	6"x8"	300RS	AS NOTED	DUCT MOUNTED	ADL	1,2,4
(N)	12"x8"	10"x8"	300RS	AS NOTED	DUCT MOUNTED	ADL	1,2,4
(O)	44"x20"	42"x18"	350RL	AS NOTED	DUCT MOUNTED	RETURN	1,4
(P) HALL, 10" TITUS	8"x8"	6"x8"	THO-8R	AS NOTED	SUPPRESSED	ADL	1,2,4,2
(Q)	8"x8"	6"x8"	300R	AS NOTED	SURFACE AND R-CL-100	RETURN	1,2,4
(R)	10"x10"	6"x	54R	AS NOTED	EXPOSED	ADL	1,2,4

- 1) FINISH TO BE SELECTED BY ARCHITECT.
2) FURNISH NECK MOUNTED OPP. GLASS DAMPER.
3) FRAME TO BE COMPATIBLE WITH STD. T-BAR CEILING.
4) FRAME TO BE COMPATIBLE WITH PLASTER, DRYWALL, OR OTHER SURFACE MOUNTINGS.
- 5) FURNISH WITH FACTORY INSULATED PLUNIAL.
6) MOUNTED BETWEEN SUSPENDED CEILING TILES FLUSH WITH CEILING TILES.
7) SUSPEND FROM STRUCTURE ABOVE.
8) TO BE MOUNTED IN LAY-IN TILE. SUPPORT FROM ABOVE.

FAN SCHEDULE

SYMBOL	COOK MODEL #	CFM	ESP (IN. W.P.T.)	RPM	DRIVE	ELECTRICAL	ROOF OPENING	DUTY	DAMPER	NOTES	
EF-1	ACEB-10024	1520	0.75	134	1123	BELT	120/60/1	N/A	TOILET	GRWY	2.6,7,8
EF-2	GC-124	76	0.35	(53)	1000	DIRECT	120/60/1	N/A	TOILET	GRWY	1.2,3,4,7,8
EF-3	ACEB-70C38	200	0.5	1/6	1516	BELT	120/60/1	13-1/2" SQUARE	MOLDEN FLOOR	GRWY	3.6,7,8
EF-4	ACEB-70C38	200	0.5	1/6	1516	BELT	120/60/1	13-1/2" SQUARE	MOLDEN FLOOR	GRWY	3.6,7,8
EF-5	ACEB-80C39	400	0.5	1/6	1424	BELT	120/60/1	13-1/2" SQUARE	KITCHEN FLOOR	GRWY	3.6,7,8
WF-6	GC-144	130	0.25	(86.3)	1100	DIRECT	120/60/1	N/A	COPY RM	GRWY	2.5,7,8
WF-7	GC-144	130	0.25	(86.3)	1100	DIRECT	120/60/1	N/A	COPY RM	GRWY	2.5,8

- | | |
|--|---|
| 1) WIRED BY E.C. TO WALL SWITCH. | 7) FURNISH ROOF CURB, INSTALLED BY GENERAL CONTRACTOR. |
| 2) FURNISH WITH PLUGS AND CORD DISCONNECT. | 8) FURNISH ROOF CAP, INSTALLED BY G.C. |
| 3) FURNISH WITH DISCONNECT SWITCH. | 9) SUSPENDED MOUNTING, SUPPORT FROM STRUCTURE ABOVE, PROVIDE VIBRATION ISOLATORS. |
| 4) TO BE CONTROLLED BY BUILDING CONTROL SYSTEM. | 10) FURNISH WITH WIRESCOTERS. |
| 5) FURNISH WALL MOUNTED VARIABLE SPEED CONTROLLER, WIRED BY E.C. | |
| 6) FURNISH WALL MOUNTED 110V VOLTAGE TRANSFORMER, WIRED BY E.C. | |

LOUVER SCHEDULE

[illegible]

- | | |
|--|---|
| 1) FINISH TO BE SELECTED BY ARCHITECT. | 5) WIRED BY E.C. TO OPEN WHEN EF-4 OPERATES |
| 2) EXTRUDED ALUMINUM CONSTRUCTION. | 6) WIRED BY E.C. TO OPEN WHEN EF-3 OPERATES |
| 3) INSECT SCREEN BEHIND LOUVER. | |
| 4) MOTOR OPERATED CONTROL DAMPER, RUSKIN CDS1PB. | |

FINNED RADIATION SCHEDULE

ENCLOSURE DATA										ELEMENT DATA			
SYMBOL	LENGTH (APPROX.)	BOTTOM TO FLOOR	TOP TO FLOOR	DEPTH	TUBE SIZE	FIN SIZE	TOTAL LENGTH	ROWS	GPM	HP/W/L	TOTAL GPM	DERINGS	NOTES
BB-1	40	"4"	10'-3/4"	10'-5/8"	1"	+4-2" + 4-2"	2	6	440	53.200	10	1,2,4,5	
BB-2	7	"6"	10'-3/4"	1"	3-3/4"	3-3/4"	6	1	650	3.900	10192010	1,2,4,5	
BB-3	5	"6"	10'-3/4"	1"	3-3/4"	3-3/4"	6	1	650	2.600	1012010	1,2,4,5	

1) ENCLOSURE FINISHES TO BE SELECTED BY ARCHITECT.

2) CAPACITIES BASED ON 170° AVERAGE WATER TEMPERATURE.

3) ALL UNITS TO BE 100% LEAK PROOF.

4) WALL MOUNTED, SLOPED TOP.




5) FLUSHMOUNT WITH ALL REQUIRED END CAPS AND CORNERS.

- | | |
|--|--|
| 1) ENCLOSURE FINISHES TO BE SELECTED BY ARCHITECT. | 4) WALL MOUNTED, SLOPED TOP. |
| 2) CAPACITIES BASED ON 170° AVERAGE WATER TEMPERATURE. | 5) FURNISH WITH ALL REQUIRED END CAPS AND CORNERS. |
| 3) PEDESTAL MOUNTED, EQUAL TO TRANE ESA-2W. | |



MCMULLEN ENGINEERING CO., INC.
MECHANICAL AND ELECTRICAL ENGINEERING

100 South State Street, Westerville, Ohio 43081
614-895-9408 FAX: 614-895-9450
E-Mail: mec@mcmulleneng.com
Web: <http://www.mcmulleneng.com>

21 SEPT. 2010 BULLETIN #0 
24 MAY 2010 ADDENDUM #3 
14 MAY 2010 ADDENDUM #1 

~~21 SEPT. 2010~~
BID SET 3 MAY 2010
BULLETIN A 28 JULY 2010

**PERFORMING ARTS CENTER
EXPANSION**
CLARK STATE COMMUNITY COLLEGE
275 South Limestone Street
Springfield, Ohio 45506
OH PROJ. # 385-06-103

HVAC SCHEDULES

H-7
~~SECRET~~

H & A Mechanical, Inc.**Submittal**

Date: 7/15/2010

Project: **Performing Arts Center Expansion**
Clark State Community College
 275 South Limestone Ave., Springfield, OH 45505

Architect: **Lincoln Street Studio, Ltd.**
 45 East Lincoln St., Columbus, OH 43215-1515
 614 461-1144
 614 461-8030, fax

Mechanical Engineer: **McMullen Engineering Company, Inc.**
 779 Brooksedge Blvd., Westerville, OH 43081
 614 895-9408
 614 895-9450, fax

Contractor: **H and A Mechanical, Inc.**
 P. O. Box 255, Baltimore, OH 43105
 740 862-2101
 740 862-2090 fax

Specification Section	Item	Manufacturer	Representative
238101	Packaged Rooftop Unit	Trane	Trane - Columbus 2300 CityGate Drive, Suite 100 Columbus, OH 43219 614-473-3500 614-473-3501, fax Brian McGann

APPROVED

H and A Mechanical, Inc.

By: *Carmela Houk*
 Carmela Houk, Project Manager

Date: 7/15/2010

McMullen Engineering Co. Inc.	
REVIEW HEREBY DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR ANY DEVIATIONS FROM THE CONTRACT DOCUMENTS OR ERRORS OR OMISSIONS IN THE SHOP DRAWINGS SUBMITTED	
<input checked="" type="checkbox"/>	REVIEWED
<input type="checkbox"/>	REVIEWED W/COMMENTS
<input type="checkbox"/>	REVISE AND RESUBMIT
CHECKED <u><i>YH</i></u>	DATE <u><i>8/24/10</i></u>
SHOP DRAWING	

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(

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TRANE

Submittal

Prepared For:
McMullen Engineering

Date: July 06, 2010

Customer P.O. Number:
Customer Project Number:

Sold To:
H & A Mechanical

Job Number:
Job Name:
Clark State Performing Arts Center

Trane U.S. Inc. is pleased to provide the enclosed submittal for your review and approval.

Product Summary

Qty	Product	
1	Commercial VAV Packaged Rooftop Ipak	Tag: RTU-1 Specification: 238101

Brian McGann
Trane
2300 CityGate Drive, Suite 100
Columbus, OH 43219-3652
Phone: (614) 473-3500
Fax: (614) 473-3501

The attached information describes the equipment we propose to furnish for this project, and is submitted for your approval.

Table Of Contents

Product Summary	1
Commercial Rooftop Air Conditioning Units (Midrange) (Item A1)	
Tag Data	3
Product Data	3
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Tag Data - Commercial Rooftop Air Conditioning Units (Qty: 1)

Item	Tag(s)	Qty	Description	Model Number
A1	RTU-1	1	20-75 Ton Packaged Industrial Rooftop (SFHLF

Product Data - Commercial Rooftop Air Conditioning Units**Item: A1 Qty: 1 Tag(s): RTU-1**

DX Cooling With Natural Gas Heat 460/3
Dual circuits factory charged with R410a
Multiple scroll compressors
UL listed, ARI Certified Capacity
Modulating exhaust fan with Statitrac building pressure control
Gas heat with modulating power burner - 10:1 turndown. Preheat mode
Economizer with low leak dampers
2' 30% MERV 8 filters (2 sets)
Spring isolators for fans
Intellipak VAV control system
Factory mounted supply fan VFD with bypass and duct static pressure control
Tracer BAS interface
Access doors
Extended grease lines
Remote operator interface panel
Unit mounted disconnect switch
14" standard roof curb
Kinetics KSR 2' spring rail assembly (field mounted)
Startup services

5yr compressor and HX material warranty.

NOTE: Rigging, smoke detectors, filter gages not included

Performance Data - Commercial Rooftop Air Conditioning Units

Tags	RTU-1
Design airflow (cfm)	22000
Exhaust Airflow (cfm)	19000
Cooling EDB (F)	83.00
Cooling EWB (F)	68.00
Ambient DB (F)	95.00
Leaving Coil DB (F)	57.45
Leaving Coil WB (F)	56.93
Gross total capacity (MBh)	763.64
Gross sensible capacity (MBh)	610.20
Gross latent capacity (MBh)	153.44
Input htg capacity (MBh)	500.00
Output htg capacity (MBh)	410.00
Heating EAT (F)	45.00
Heating LAT (F)	62.18
Heating delta T (F)	17.18
Supply duct static pressure (in H2O)	1.750
Return duct static pressure (in H2O)	0.750
Total static pressure (in H2O)	4.050
Supply motor BHP calculated (bhp)	30.16
Supply fan RPM calculated (rpm)	1013
Supply Fan Motor	40 HP
Exhaust static pressure (in H2O)	0.750
Exhaust motor BHP calculated (bhp)	6.18
Exhaust fan RPM calculated (rpm)	575
Exhaust fan Motor	10 HP
EER @ ARI (EER)	10.3
Minimum circuit ampacity (A)	175.43
Maximum overcurrent protection (A)	200.00
Minimum disconnect switch size (A)	187.00
Recommended dual element (A)	200.00

Electrical Coordination:

MOCP: 200 A

Lugs: 1) # 1 – 300 MCM per phase

Mechanical Specifications - Commercial Rooftop Air Conditioning Units (Midrange)**Item: A1 Qty: 1 Tag(s): RTU-1****General - R410A**

Units shall be specifically designed for outdoor rooftop installation on a roof curb and be completely factory assembled and tested, piped, internally wired, fully charged with R-410A compressor oil and shipped in one piece. Units shall be available for direct expansion cooling only, or direct expansion cooling with natural gas, electric, hot water or steam heating. Filters, outside air system, exhaust air system, optional non-fused disconnect switches and all operating and safety controls shall be furnished factory installed. All units shall be cULus approved and factory run tested. Cooling capacity shall be rated in accordance with ARI Standard 360. All units shall have decals and tags to aid in service and indicate caution areas. Electrical diagrams shall be printed on long life water resistant material and shall ship attached to control panel doors.

Casing

Exterior panels shall be zinc coated galvanized steel, phosphatized and painted with a slate grey air-dry finish durable enough to withstand a minimum of 500 hours consecutive salt spray application in accordance with standard ASTM B117. Screws shall be coated with zinc-plus-zinc chromate. Heavy gauge steel hinged access panels with tiebacks to secure door in open position shall provide access to filters and heating sections. Refrigeration components, supply air fan and compressor shall be accessible through removable panels as standard. Unit control panel, filter section, and gas heating section shall be accessible through hinged access panels as standard. Optional Double Wall Construction hinged access doors shall provide access to filters, return/exhaust air, heating and supply fan section. All access doors and panels shall have neoprene gaskets. Interior surfaces or exterior casing members shall have 1/2" Tuf-Skin fiberglass insulation. Unit base shall be watertight with heavy gauge formed load bearing members, formed recess and curb overhang. Unit lifting lugs shall accept chains or cables for rigging. Lifting lugs shall also serve as unit tiedown points.

Compressors - R410A

The Trane 3-D Scroll compressors have a simple mechanical design with only three major moving parts. Scroll type compression provides inherently low vibration. The 3-D Scroll provides a completely enclosed compressor chamber with optimized scroll profiles which leads to increased efficiency. The 3-D Scroll includes a direct-drive, 3600 rpm, suction gas cooled hermetic motor. Dependent on the compressor model, motor protection is provided by either a patented motor cap and integral line break motor protector or an external 24 VAC module which provides protection against incorrect phase sequence, excess motor temperatures, over current protection, and phase loss. Trane 3-D compressor includes centrifugal oil pump, scroll tips seals, internal heat shield that lowers the heat transfer from discharge and suction gas, oil level sight glass and oil charge valve. Some compressor models also provide a dip tube that allows for oil draining, in addition to a low leakage internal discharge check valve to help prevent refrigerant migration. Each compressor shall have a crankcase heater installed, properly sized to minimize the amount of liquid refrigerant present in the oil sump during off cycles.

Phase and Voltage Monitor R410A

Standard on all IntelliPak R410A units. Protects 3-phase equipment from phase loss, phase reversal, and low voltage. Any fault condition will produce a Failure Indicator LED, and send the unit into an emergency stop condition. cULus approved.

Evaporator Coil - R410A

Internally enhanced copper tubing of 3/8" or 1/2" O.D. shall be mechanically bonded to heavyduty aluminum fins of configured design. All coils shall be equipped with thermal expansion valves and factory pressure and leak tested.

Condenser Coil - R410A

Configured aluminum fin secondary surface shall be mechanically bonded to primary surface of 5/16" O.D. internally enhanced copper tubing for extra corrosion resistance. Subcooling circuit(s) shall be provided as standard. All coils shall be factory pressure tested and vacuum dehydrated.

Condenser Fans and Motors

All condenser fans shall be vertical discharge, direct drive fans, statically balanced, with steel blades and zinc plated steel hubs. Condenser fan motors shall be three-phase motors with permanently lubricated ball bearings, built-in current and thermal overload protection and weathertight slingers over motor bearings.

Supply Fan

All supply fans shall have two double inlet, forward-curved fans mounted on a common shaft with fixed sheave drive and shall be dynamically balanced and tested in factory. Supply fan shall be test run in unit as part of unit test and unit shall reach rated rpm before the fan shaft passes through first critical speed. Fan shaft shall be mounted on two grease lubricated ball bearings designed for 200,000 hours average life. Optional extended grease lines shall allow greasing bearings from unit filter section. Fan motor and fan assembly shall be mounted on common base to allow consistent tension with no relative motion between fan and motor shafts. Entire assembly shall be completely isolated from unit and fan board by double deflection rubber-in shear isolators, or by optional 2" deflection spring isolation. All supply fan motors meet the U.S. Energy Policy Act of 1992 (EPACT).

Unit Controller

DDC microprocessor controls shall be provided to control all unit functions. The control system shall be suitable to control CV or VAV applications. The controls shall be factory-installed and mounted in the main control panel. All factory-installed controls shall be fully commissioned (run tested) at the factory. The unit shall have a Human Interface Panel with a 16 key keypad, a 2 line X 40 character clear English display as standard to provide the operator with full adjustment and display of control data functions. The unit controls shall be used as a stand-alone controller, or as part of a building management system involving multiple units.

1

The unit shall be equipped with a complete microprocessor control system. This system shall consist of temperature and pressure (thermistor and transducer) sensors, printed circuit boards (modules), and a unit mounted Human Interface Panel. Modules (boards) shall be individually replaceable for ease of service. All microprocessors, boards and sensors shall be factory mounted, wired and tested. The microprocessor boards shall be stand-alone DDC controls not dependent on communications with an on-site PC or a Building Management Network. The microprocessors shall be equipped with on-board diagnostics, indicating that all hardware, software and interconnecting wiring are in proper operating condition. The modules (boards) shall be protected to prevent RFI and voltage transients from affecting the board's circuits. All field wiring shall be terminated at separate, clearly marked terminal strip. Direct field wiring to the I/O boards is not acceptable. The microprocessor's memory shall be non-volatile EEPROM type requiring no battery or capacitive backup, while maintaining all data.

2

Zone sensors shall be available in several combinations with selectable features depending on sensor.

3

The Human Interface Panel's keypad display character format shall be 40 characters x 2 lines. The character font shall be 5 x 7 dot matrix plus cursor. The display shall be Supertwist Liquid Crystal Display (LCD) with blue characters on a ray/green background which provides high visibility and ease of interface. The display format shall be in clear English. Two or three digit coded displays are not acceptable.

4

The keypad shall be equipped with 16 individual touch-sensitive membrane key switches. The switches shall be divided into four separate sections and be password protected from change by unauthorized personnel. The six main menus shall be STATUS, SETPOINTS, DIAGNOSTICS, SETUP, CONFIGURATION and SERVICE MODE.

High efficiency throwaway

Shall be two-inch high efficiency media filters with average dust spot efficiency of 25-35 percent and an average arrestance in excess of 90 percent when tested in accordance with ASHRAE 52-76.

Modulating 100 Percent Exhaust Fan with Statitrac Control Two, double-inlet, forward-curved fans shall be mounted on a common shaft with fixed sheave drive. All fans shall be dynamically balanced and tested in factory before being installed in unit. Exhaust fan shall be test run as part of unit final run test. Unit shall reach rated rpm before fan shaft passes through first critical speed. Fan shaft shall be mounted on two grease lubricated ball bearings designed for 200,000-hour average life. Optional extended grease lines shall be provided to allow greasing of bearings from unit filter section. Fan motor and assembly shall be mounted on common base to allow consistent belt tension with no relative motion between fan and motor shafts. Entire assembly shall be completely isolated from unit and fan board by double deflection, rubber in shear isolators or spring isolation on motor sizes larger than five hp. For both CV and VAV rooftops, the 100 percent modulating exhaust discharge dampers (or VFD) shall be modulated in response to building pressure. A differential pressure control system, (Statitrac), shall use a differential pressure transducer to compare indoor building pressure to outdoor ambient atmospheric pressure. The FC exhaust fan shall be turned on when required to lower building static pressure setpoint. The (Statitrac) control system shall then modulate the discharge dampers (or VFD) to control the building pressure to within the adjustable, specified dead band that shall be adjustable at the Human Interface Panel. All exhaust fan motors meet the U.S. Energy Policy Act of 1992 (EPACT).

Variable Frequency Drive

General Description:

The AC Drive and all associated optional equipment are UL listed according to Power Conversation Equipment UL 508C and CSA certified. The AC Drive is designed, constructed and tested in accordance with NEMA ICS, NFPA, and IEC standards. The Drive is housed in a metal NEMA 1 enclosure. All standard and optional features are included within the Drive enclosure, unless otherwise specified. The Drive converts incoming fixed frequency three-phase AC power into a variable frequency and voltage for controlling the speed of three-phase AC motors. DC link reactors are provided on both the positive and negative rails of the DC bus equal to 3% impedance to minimize power line harmonics. Full load amp ratings meet or exceed NEC Table 430-150. The Drive provides full rated output current continuously, 110% of rated current for 60 seconds and 160% of rated current for up to 0.5 second while starting.

Isolation is provided between the Drive's power circuitry and control circuitry to ensure operator safety and to protect connected electronic control equipment from damage caused by voltage spikes, current surges, and ground loop currents. Audible motor noise is minimized through the use of an adjustable carrier frequency. Carrier frequency is automatically adjusted to optimize motor and AC Drive efficiencies while reducing motor noise. Operating range, ambient temperature, -10 to 50°C (14 to 104°F), 0 to 95% relative humidity, non-condensing, AC line voltage variation, -10 to +10% of nominal with full output.

Protective Features

Class 10 I2t electronic motor overload protection for single motor applications is provided. Protection against input transients, loss of AC line phase, output short circuit, output ground fault, over-voltage, under-voltage, AC Drive over-temperature and motor over-temperature. All faults are displayed in plain English. Protection from AC Drive sustained power or phase loss. Full rated output with an input voltage as low as 90% of nominal. Continuous operation with reduced output with an input voltage as low as 164 V AC for 208/230 volt units, 313 V AC for 460 volt units, and 394 volts for 600 volts units. Semi-conductor rated input fuses to protect power components. A "signal loss detection" circuit senses the loss of an analog input signal such as 4 to 20 mA or 0 to 10 V DC, and is programmable to react as desired in such an instance.

Default: After 10-second time out the Drive will shut off. Will function normally when the keypad is removed while the AC Drive is running and continue to follow remote commands. AC Drive catches rotating motor operating forward or reverse up to full speed. The AC Drive is rated for 100,000 amperes interrupting capacity (AIC). Includes current sensors on three output phases to detect and report phase loss to the motor. Identifies which of the output phases is low or lost. Continues to operate without faulting until input voltage reaches 300 V AC on 208/230 volt units, 539 V AC on 460 volt units, and 690 volts on 600 volt units.

Interface Features

Off/Stop and Auto/Start selector switches provided to start and stop the AC Drive and determine the speed reference. On units with bypass, an AC Drive/Off/Bypass Hand selector switch will be provided in the unit control box. In case of an external current overload, a normally closed dry contact will stop the motor whether in DRIVE or BYPASS mode. In DRIVE mode speed reference is provided by a 0 to 10 V DC analog input. The display is programmable to display in 9 languages including English, Spanish and French. The display has four lines, with 20 characters on three lines and eight large characters on one line. The following points are controlled and/or accessible: AC Drive Start/Stop. Speed reference, Fault diagnostics, Meter points to include - Motor power in HP, Motor power in kW, Motor kW-hr, Motor current, Motor voltage, Hours run, DC link voltage, Thermal load on motor, Thermal load on AC Drive and Heatsink temperature.

The AC Drive stores in memory the last 10 faults and related operational data. Four simultaneous displays are available, frequency or speed, run time, output amps and output power. The following displays are accessible from the keypad. Reference Signal Value, Output Frequency in Hz or percent, Output Amps, Motor HP, Motor kW, kW hour, Output Voltage, DC Bus Voltage, AC Drive Temperature in degrees, and Motor Speed in RPM.

A quick setup menu with factory preset parameters is provided on the AC Drive eliminating the need for macros. A red FAULT light, a yellow WARNING light and a green POWER-ON light are provided. These indications are visible both on the keypad and on the AC Drive when the keypad is removed. The AC Drive includes a standard EIA-485 communication port and capability for future connection to a Modbus communication interface.

If the temperature of the AC Drive's heat sink rises to 80°C, the AC Drive automatically reduces its carrier frequency to reduce the heat sink temperature. If the temperature of the heat sink continues to rise the AC Drive automatically

reduces its output frequency to the motor. As the AC Drive's heat sink temperature returns to normal, the AC Drive automatically increases the output frequency to the motor and returns the carrier frequency to its normal switching speed. The AC Drive has temperature controlled cooling fans for quiet operation and minimized losses.

Adjustments and Factory Default Settings

AC Drive carrier frequency is adjustable in steps of not less than 0.1 kHz to allow tuning the AC Drive to the motor. For acceleration and four deceleration ramps are provided. Acceleration and deceleration time is adjustable over the range from 0 to 3,600 seconds to base speed. The shape of these curves is automatically contoured to ensure no-trip acceleration and deceleration. Factory Default: The Drive is programmed for an acceleration and deceleration time of 30 seconds. Four current limit settings will be provided. Factory Default: The Drive is programmed for 1 X rated current. If the AC Drive trips on one of the following conditions, the AC Drive will be programmable for automatic or manual reset: under-voltage, over-voltage, current limit and inverter overload.

Factory Default: The Drive is programmed for 1 X rated current. If the AC Drive trips on one of the following conditions, the AC Drive will be programmable for automatic or manual reset: under-voltage, over-voltage, current limit and inverter overload. Factory Default: The Drive is programmed for automatic reset. The number of restart attempts is selectable from 0 through infinity and the time between attempts is adjustable from 0 through 600 seconds. Factory Default: 3 attempts, 10 seconds between attempts. After 3 failed restart attempts, the drive automatically reverts to the manual reset mode. An automatic "on delay" may be selected from 0 to 120 seconds. Factory Default: The Drive is programmed for 0 seconds delay.

0-100 percent modulating economizer

Operated through the primary temperature controls to automatically utilize OA for "free" cooling. Automatically modulated return and OA dampers shall maintain proper temperature in the conditioned space. Economizer shall be equipped with an automatic lockout when the outdoor high ambient temperature is too high for proper cooling. Minimum position control shall be standard and adjustable at the Human Interface Panel or with a remote potentiometer or through the building management system. A spring return motor shall ensure closure of OA dampers during unit shutdown or power interruption. Mechanical cooling shall be available to aid the economizer mode at any ambient. Low leak economizer dampers shall be standard with a leakage rate of 2.5 percent of nominal airflow (400 CFM/ton) at 1" wg. static pressure.

Ultra low-leak economizer dampers

Standard low leak dampers shall be provided with chlorinated polyvinyl chloride gasketing added to the damper blade and rolled stainless steel jamb seals to the sides of the damper assembly. Ultra low-leak economizer dampers shall have a leakage rate of one percent based on testing data completed in accordance with AMCA Standard 500 at AMCA Laboratories.

Economizer Control with Dry Bulb

Used with the fresh air economizer, an outdoor temperature sensor is included for comparing the outdoor dry bulb temperature to a locally adjustable temperature setpoint. The setpoint is programmed at the human interface, or remote human interface, to determine if outdoor air temperature is suitable for economizer operation.

Gas-fired heating option, Full Modulation

All gas-fired units shall be completely assembled and have a wired gas fired heating system integral within unit. Units shall be cULus approved specifically for outdoor applications downstream from refrigerant cooling coils. All gas piping shall be threaded connection with a pipe cap provided. Gas supply connection shall be provided through the side or bottom of unit. All units shall be fire tested prior to shipment.

Heat Exchanger shall be tubular two pass design with stainless steel primary and secondary surfaces. Free floating design shall eliminate expansion and contraction stresses and noises. Gasketed cleanout plate shall be provided for cleaning of tubes/turbulators. Heat exchanger shall be factory pressure and leak tested.

Burner shall be a stainless steel industrial type with an air proving switch to prevent burner operation if the burner is open for maintenance or inspection. Ceramic cone shall be provided to shape the flame to prevent impingement on sides of heat exchanger drum. Burner assembly shall house ignition and monitoring electrode.

Combustion Blower shall be centrifugal type fan to provide air required for combustion. Fan motor shall have built-in thermal overload protection.

Gas Safety Controls shall include electronic flame safety controls to require proving of combustion air prior to ignition sequence which shall include a 60 second pre-purge cycle. Direct spark ignition shall be provided on 235 and 350 MBh

heat exchangers and pilot ignition shall be provided on 500, 850 and 1000 MBh heat exchanger units. Continuous electronic flame supervision shall be provided as standard.

Full Modulation Gas Heaters shall be made from grades of stainless steel suitable for condensing situations. The heater shall have a turn down ratio of at least 4 to 1.

High Capacity Unit Ton - R410A

Units are made high capacity through the use of larger compressors that provide higher refrigerant mass flowrates. (25T unit will also have a 4 row condenser coil to provide higher capacity results).

Remote Human Interface Panel (RHI)

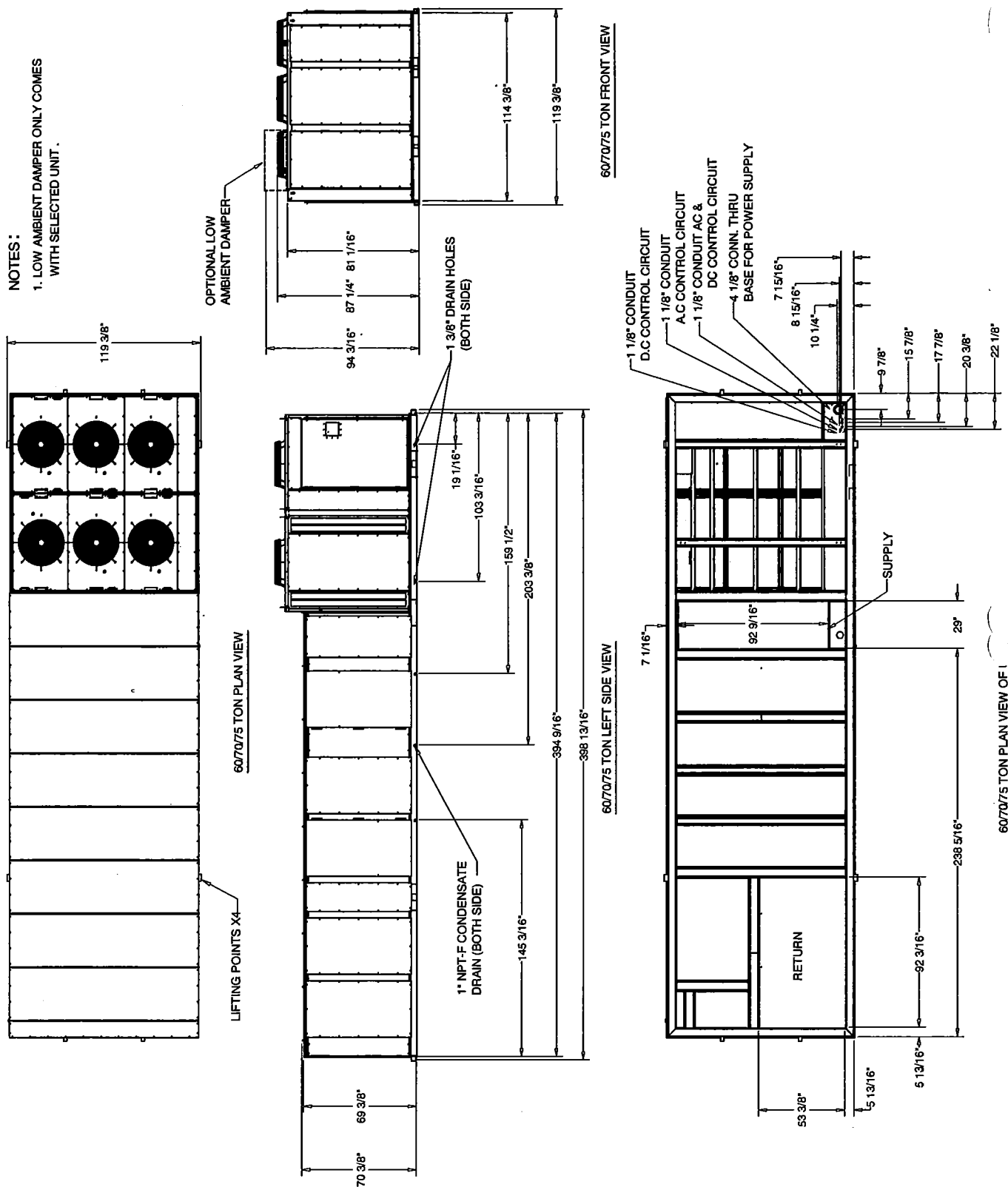
Remote Human Interface Panel can perform all the same functions as unit mounted Human Interface Panel, except for the Service Mode. Up to 4 rooftop units can be monitored and controlled with a single Remote Human Interface Panel. This panel uses the same attractive enclosure as our Tracker? building control panel. With features such as a 2 line X 40 character clear English display, a red LED light to indicate an alarm condition (alarm also shown on the two line display), a simple 16 key keypad that is used in conjunction with the display, to prompt the infrequent user when making desired changes and an attractive hinged door makes the RHI very suitable for mounting on any wall. The RHI can be mounted inside a building, up to 5,000 feet from the unit. The RHI is wired to the IPCB mounted in the rooftop with twisted wire pair communication wiring and 24V control wiring.

Trane Communication Interface Module (TCI)

Provides interface to Trane's Integrated Comfort system (ICS), which allows control and monitoring of the rooftop by a Tracer building management system.

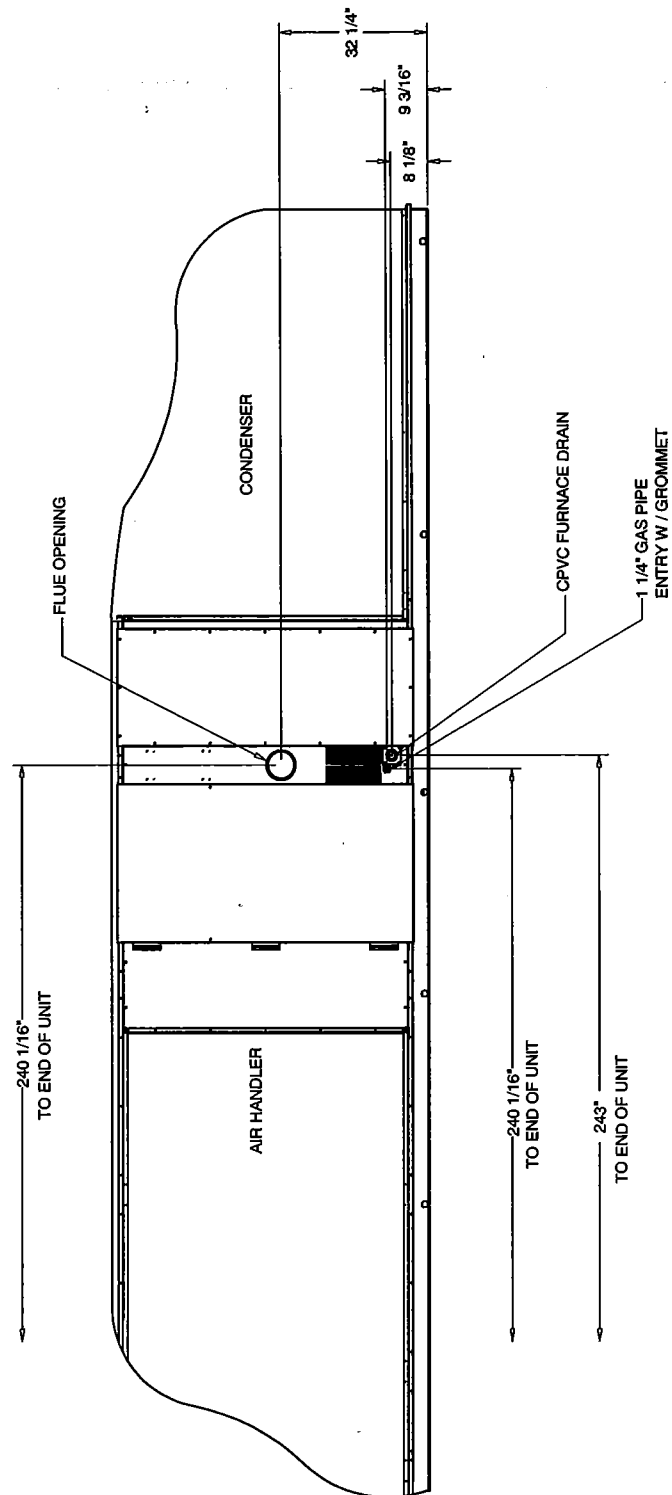
Unit Dimensions - Commercial Rooftop Air Conditioning Units (Midrange)

Item: A1 Qty: 1 Tag(s): RTU-1



Unit Dimensions - Commercial Rooftop Air Conditioning Units (Midrange)

Item: A1 Qty: 1 Tag(s): RTU-1



60 - 75 500MBH TON GAS HEAT
LEFT SIDE OF UNIT

Item: A1 Qty: 1 Tag(s): RTU-1



Unit Dimensions - Commercial Rooftop Air Conditioning Units (Midrange)**Item: A1 Qty: 1 Tag(s): RTU-1****ELECTRICAL / GENERAL DATA**

TONS Model (Tonnage) SFHLF60 (60Ton) Unit Operating Voltage Range 414-506 Unit Primary Voltage 460 Unit Hertz 60 Unit Phase 3 EER / IPLV 10.3 EER / 12.2 IPLV	GAS HEATING - PERFORMANCE Heating Input 125.0-500.0 Heating Output 410.0 Capacity Steps N/A HEATING - GENERAL DATA Gas Inlet pressure 1 1/4" Gas Pipe Connection Size 7" wc - 14" wc
COMPRESSOR Number 4 Tons (Each) 13.5 Compressor Rated Load Amps (Each) 22.2 Locked Rotor Amps (Each) 158.0	ELECTRIC HEATER Electric Heater Kw Electric Heater Full Load Amps
SUPPLY FAN MOTOR Number 1 Horsepower (Each) 40.0 Supply Fan Motor Full Load Amps 48.5	CONDENSER FAN MOTOR Number 4 Horsepower (each) 1.0 Condenser Fan Motor Full Load Amps 10.8
EXHAUST / RETURN FAN MOTOR Number 1 Horsepower (Each) 10.0 Exhaust Fan Motor Full Load Amps 13.2	FILTERS - TYPE Type: High-Efficiency Throwaway Furnished YES Number 35 Recommended Size 16" x20" x2"
REFRIGERANT TYPE Charge Type: R-410A Factory Charge (Circuit #1): 69.0 lb Factory Charge (Circuit #2): 71.0 lb	PREFILTERS Furnished Number Recommended Size

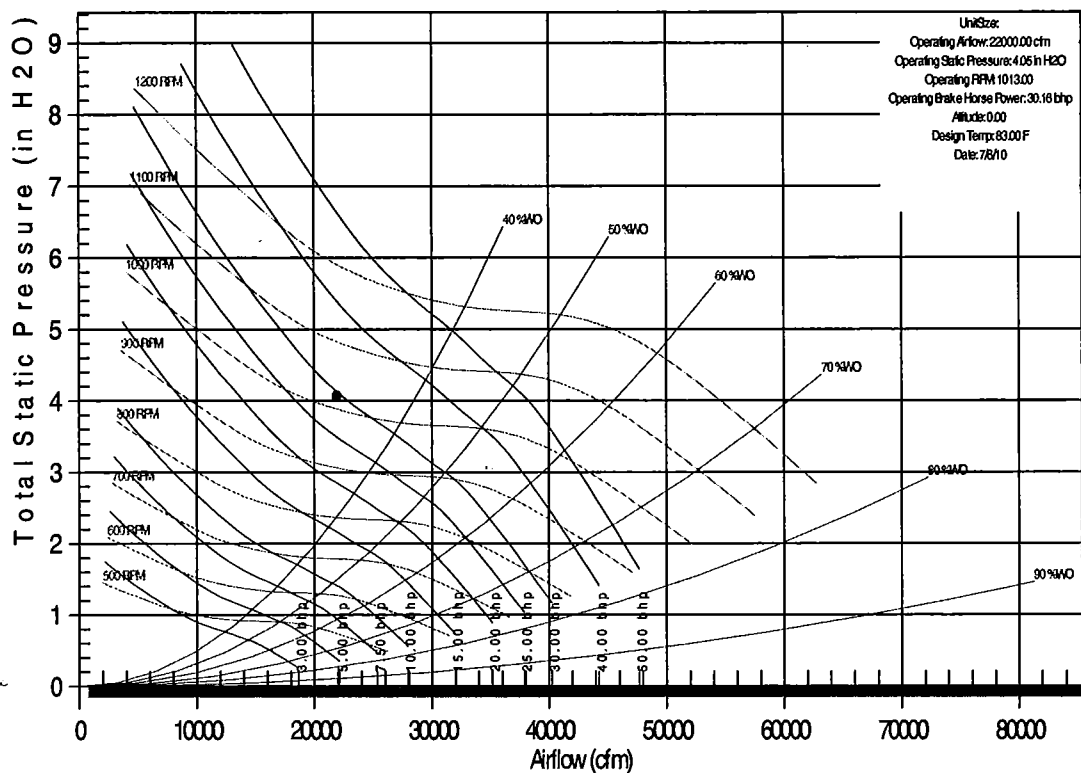
Notes:

1. LOAD 1=Current of the largest motor (compressor or fan motor); LOAD 2=Sum of the currents of all remaining motors; LOAD 3 =Current of electric heaters
LOAD 4 =Control Power Transformer (20-40 ton units add 3 FL amps for wire sizing formula, 50-75 ton units add 6 FL amps)
2. For Electric Heat MCA, MOP, RDE values, calculate for both cooling and heating modes. (When determining LOADS, the compressors do not operate when the unit is in heating mode) (On 70-75 ton single source units, heating Load 4 = 12 amps on 200,230 volt units and 9 amps on 460,575 volt units)
3. If selected Max Over Cur is less than the Min Clr Amp, then select the lowest maximum fuse size which is equal to or larger than the Min Clr Amp, provided the selected fuse size does not exceed 800 amps.
4. If the selected Recommended Dual Element fuse size is greater than the selected Max Over Cur Protection value, then select the Recommended Dual Element fuse size value to equal the Max Over Protection value.
5. Compressor KW at ARI rating conditions of 80/67 -95
6. Refrigerant charge is an approx. value. For a more precise value, see unit nameplate and service instructions.

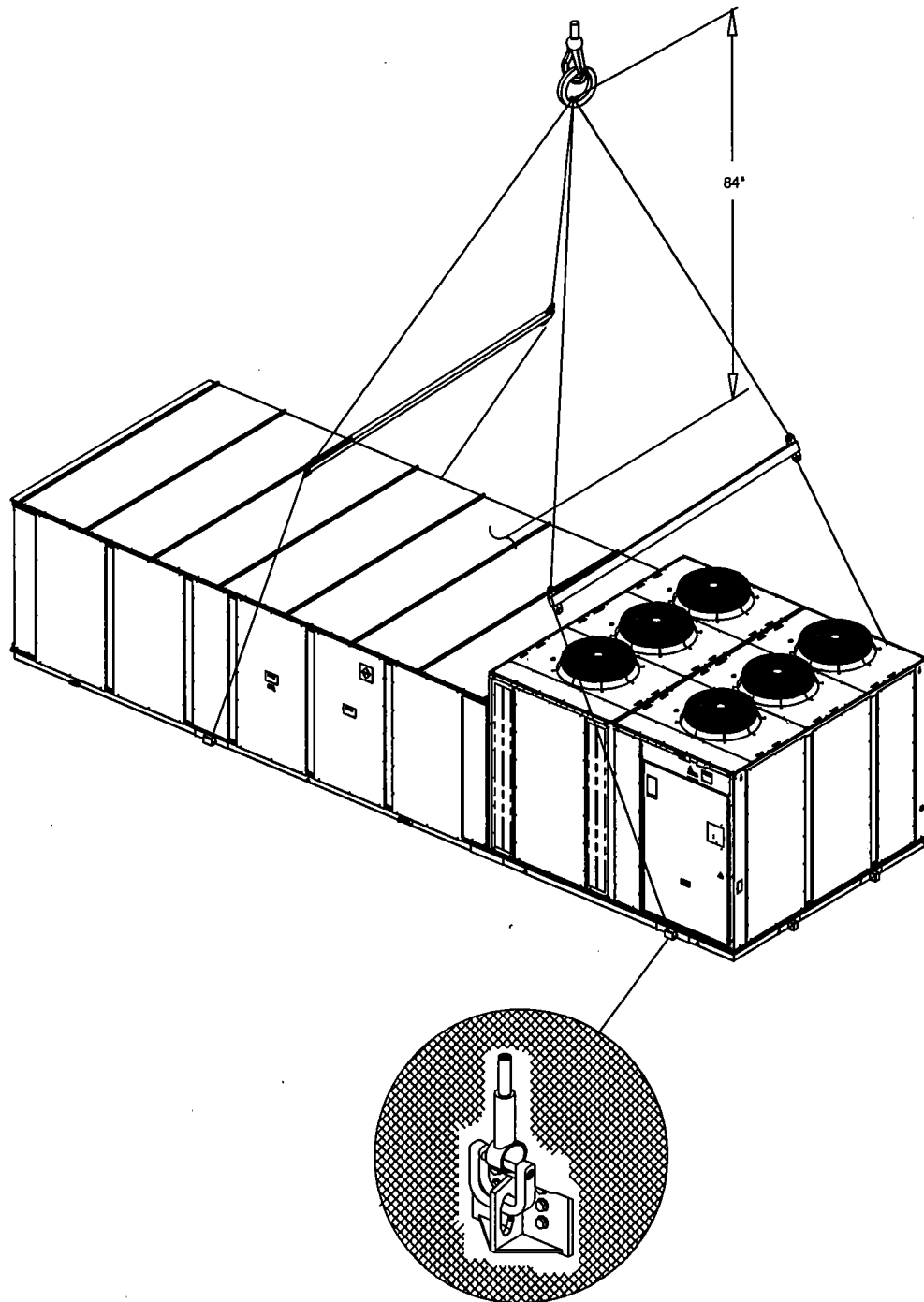
Fan Curve - Commercial Rooftop Air Conditioning Units (Midrange)

Item: A1 Qty: 1 Tag(s): RTU-1

S_HF60

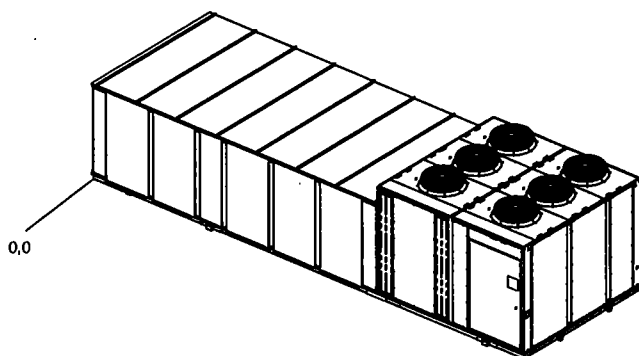
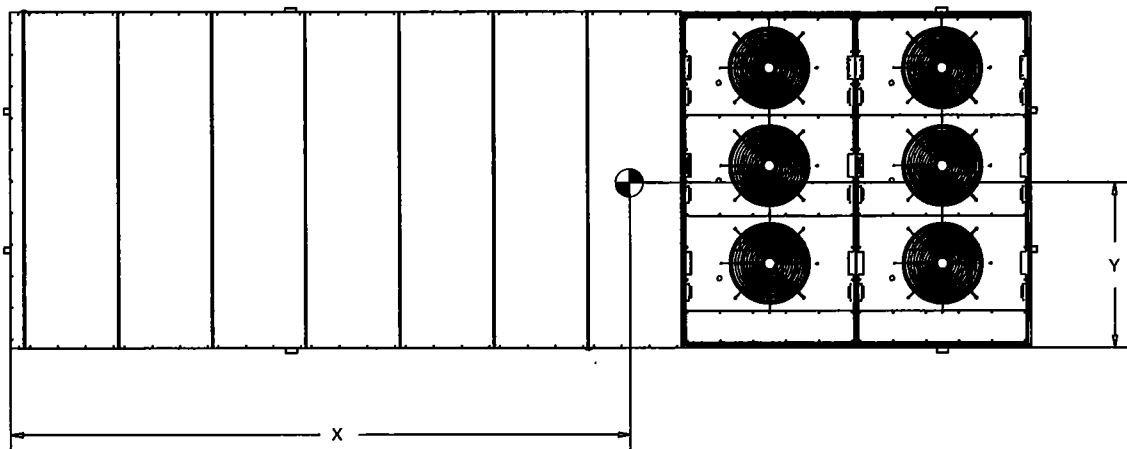


	63-hz	125-hz	250-hz	500-hz	1 kHz	2 kHz	4 kHz	8 kHz
Discharge duct:	95	93	87	85	82	79	77	73
Return duct:	87	88	81	77	74	72	68	65
Exhaust fan:	80	79	74	72	69	67	64	58

Weight, Clearance & Rigging Diagram - Commercial Rooftop Air Conditioning Units (Midrange)**Item: A1 Qty: 1 Tag(s): RTU-1**

Weight, Clearance & Rigging Diagram - Commercial Rooftop Air Conditioning Units (Midrange)

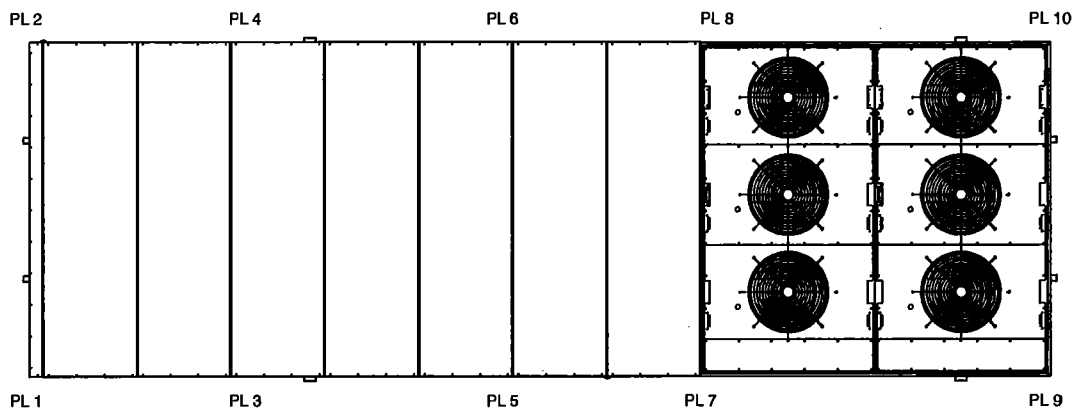
Item: A1 Qty: 1 Tag(s): RTU-1

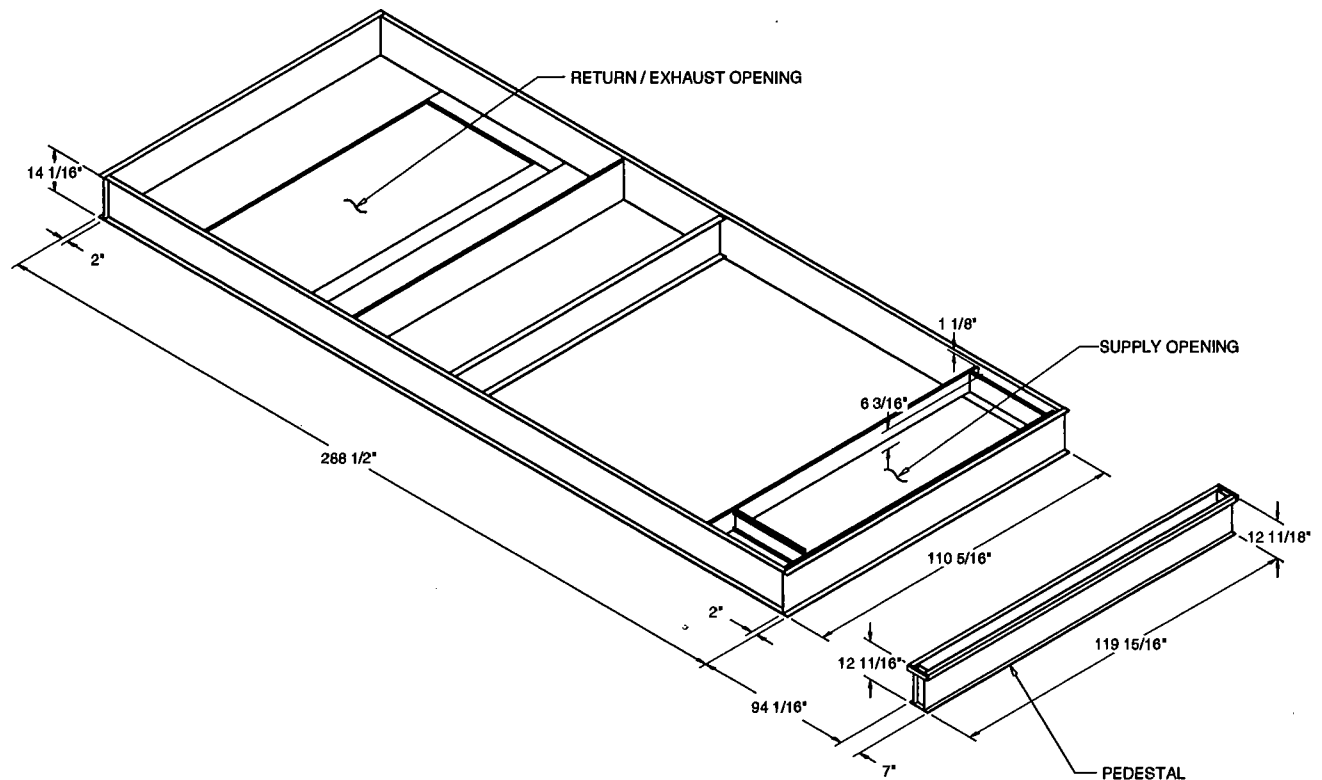


Center of Gravity X:	17.44 ft	Point load X location 1:	4.000 in
Center of Gravity Y:	4.87 ft	Point load X location 2:	101.000 in
Point Load 1:	839.0 lb	Point load X location 3:	187.000 in
Point Load 2:	761.1 lb	Point load X location 4:	274.000 in
Point Load 3:	978.1 lb	Point load X location 5:	370.000 in
Point Load 4:	900.1 lb	Point load X location 6:	N/A
Point Load 5:	1101.4 lb	Point load X location 7:	N/A
Point Load 6:	1023.4 lb	Point load X location 8:	N/A
Point Load 7:	1228.1 lb	Point load X location 9:	N/A
Point Load 8:	1148.1 lb	Point load X location 10:	N/A
Point Load 9:	1383.7 lb	Point load Y location 1:	4.000 in
Point Load 10:	1285.8 lb	Point load Y location 2:	112.00 in
Total Weight:	10626.8 lb		
Added Weight			
IRU: (3)	N/A		
Double wall: (3)	N/A		

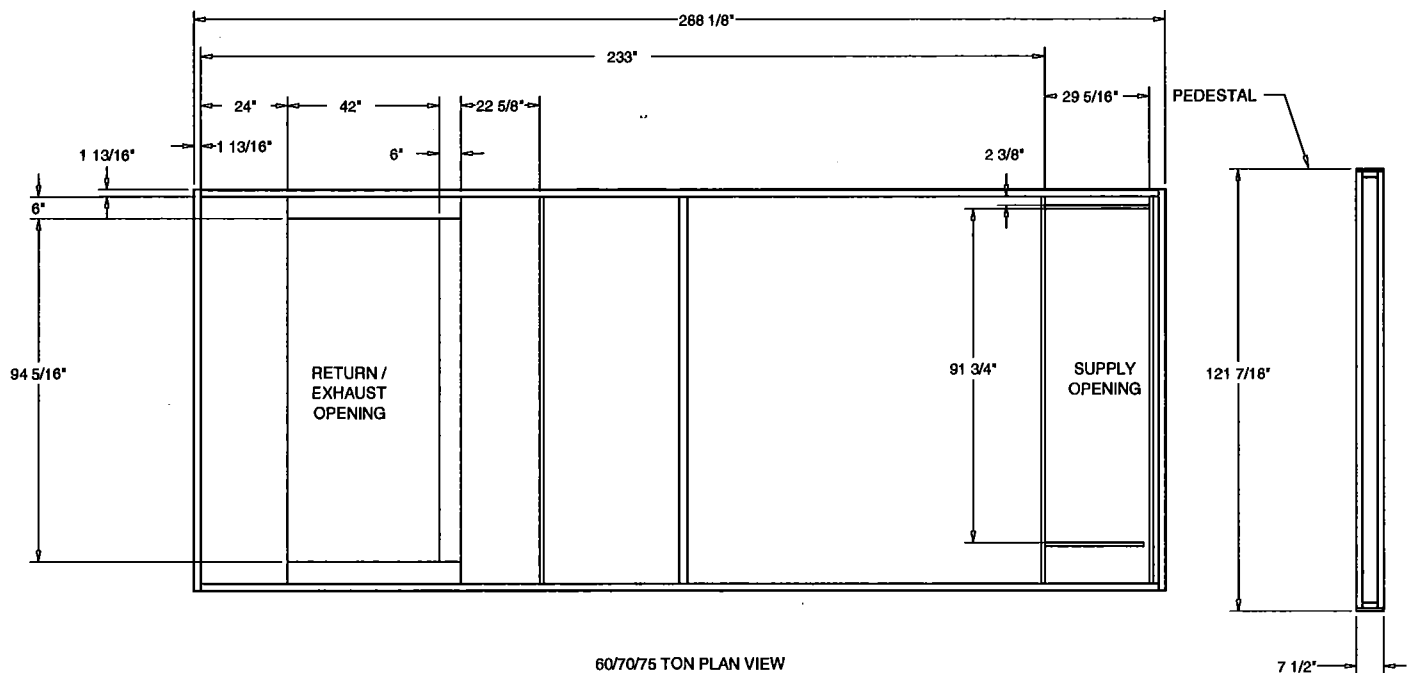
Notes:

1. The actual weight is stamped on the unit nameplate.
2. The weight shown represent the typical unit operating weights for the unit selected.
3. Add weight to the total unit weight.

CENTER OF GRIVTY AND INSTALL WEIGHT X-Y POINTS



60/70/75 TON ISOMETRIC VIEW

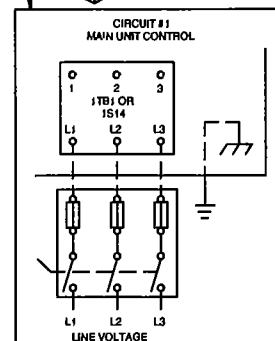
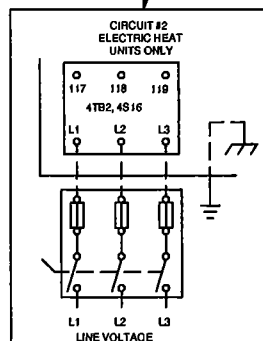
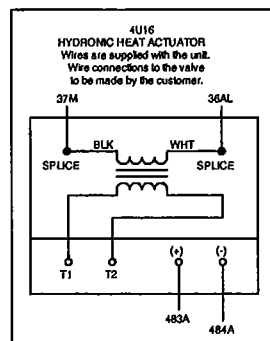


60/70/75 TON PLAN VIEW

Field Wiring - Commercial Rooftop Air Conditioning Units (Midrange)

Item: A1 Qty: 1 Tag(s): RTU-1

DEVICE PREFIX LOCATION CODE	
AREA	LOCATION
1	INSIDE UNIT CONTROL BOX
2	CONDENSER SECTION
3	AIR HANDLER SECTION
4	HEATING SECTION
5	EXTERNAL FIELD MOUNTED DEVICE



CUSTOMER CONNECTION WIRE RANGE					
UNITS WITH MAIN POWER TERMINAL BLOCK (ALL VOLTAGES)			UNITS WITH MAIN POWER DISCONNECT SWITCH		
BLOCK SIZE	WIRE QTY.	CONNECTOR WIRE RANGE	DISCONNECT SIZE	WIRE QTY.	CONNECTOR WIRE RANGE
175 AMP	1	#12-20	100 AMP	1	#14-10
210 AMP	1	#8-400 MCM	225 AMP	1	#1-300 MCM
500 AMP	2	(1)#8-500 MCM & (1)#6-300 MCM	400 AMP	1	250-500 MCM
550 AMP	2	#4-500 MCM	400 AMP	2	300-250 MCM
840 AMP	2	#2-500 MCM	800 AMP	2	250-500 MCM
			1200 AMP	2	#1-500 MCM
					500-750 MCM

NOTES

A. BLOCK SIZE & DISCONNECT SIZE IS CALCULATED BY SELECTING THE SIZE GREATER THAN OR EQUAL TO 1.15 X (SUM OF UNIT LOADS). SEE UNIT LITERATURE FOR UNIT LOAD VALUES.

B. 400 AMP DISCONNECT SELECTED BY EQUATION GIVEN IN NOTE A, AND BY THE UNIT MCA VALUE. SEE UNIT LITERATURE FOR APPROPRIATE MCA EQUATION.

IMPORTANT!
DO NOT ENERGIZE UNIT UNTIL CHECK-OUT AND START-UP PROCEDURE HAS BEEN COMPLETED

NOTE: Check to make sure the 50/60 Hz selector switch located to the left of the keypad location and below the diagnostic LEDs is set to the 60 Hz position (to the right).

TR-1 VARIABLE FREQUENCY DRIVE FACTORY SETTING SUMMARY			
MENU	PARAMETER	ADJUSTMENT	DESCRIPTION
MACRO	CF0	VT	SET FOR VARIABLE TORQUE
1	rFr		DISPLAY OUTPUT FREQUENCY
2	ACC	30	30 SECONDS ACCELERATION
2	dEC	30	30 SECONDS DECELERATION
2	LSP	22	22 HERTZ
3	SFI	HF1	SELECT HIGH SWITCH FREQ
3	SFr	8	8 KHZ SWITCHING FREQ
3	CL1	1.1 x Motor FLA	LIMITS MAX. CURRENT TO MOTOR
3	nCr	Motor NP FLA	SETS MOTOR FLA RATING FOR OL CALCULATION
2	Hsp	60 Hz	SETS MAXIMUM OUTPUT FREQUENCY
4	ICC	2W	SELECT 2 WIRE CONTROL
4	IC1	LEL	2 WIRE CONTROL MAINTAINED
5	LI2	NST	FREEWHEEL STOP WHEN LI2 OPEN
5	LI3	NO	NO ASSIGNMENT
5	LI4	NO	NO ASSIGNMENT
5	R2	RUN	R2 SET FOR DRIVE RUNNING
8	FLr	YES	ENABLE CATCH-ON-THE-FLY
8	Alr	YES	ALLOWS RESTART
8	IFL	NO	DISABLES DRIVE INPUT PHASE LOSS DETECTION
8	OPL	NO	DISABLES DRIVE OUTPUT PHASE LOSS DETECTION

WARNING

HAZARDOUS VOLTAGE!

DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING.

FAILURE TO DISCONNECT POWER BEFORE SERVICING CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.

AVERTISSEMENT

VOLTAGE HASARDEUX!

DECONNECTEZ TOUTES LES SOURCES ELECTRIQUES INCLUANT LES DISJONCTEURS SITUES A DISTANCE AVANT D'EFFECTUER L'ENTRETIEN.

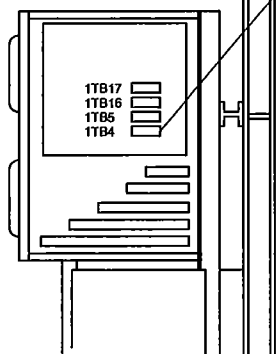
FAUTE DE DECONNECTER LA SOURCE ELECTRIQUE AVANT D'EFFECTUER L'ENTRETIEN PEUT ENTRAÎNER DES BLESSURES CORPORELLES SEVERES OU LA MORT.

CAUTION

USE COPPER CONDUCTORS ONLY

UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS.

FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.



**HAZARDOUS VOLTAGE!
DISCONNECT ALL ELECTRIC POWER
INCLUDING REMOTE DISCONNECTS
BEFORE SERVICING.
FAILURE TO DISCONNECT POWER
BEFORE SERVICING CAN CAUSE
SEVERE PERSONAL INJURY OR
DEATH.**

VOLTAGE HASARDEUX!
DECONNECTEZ TOUTES LES SOURCES
ELECTRIQUES INCLUANT LES
DISJONCTEURS SITUES A DISTANCE
AVANT D'EFFECTUER L'ENTRETIEN.
FAUTE DE DECONNECTER LA SOURCE
ELECTRIQUE AVANT D'EFFECTUER
L'ENTRETIEN PEUT ENTRAÎNER DES
BLESSURES CORPORELLES SEVERES
OU LA MORT.

**USE COPPER CONDUCTORS ONLY!
UNIT TERMINALS ARE NOT
DESIGNED TO ACCEPT OTHER
TYPES OF CONDUCTORS.
FAILURE TO DO SO MAY CAUSE
DAMAGE TO THE EQUIPMENT.**

**DO NOT ENERGIZE
UNIT UNTIL CHECK-OUT
AND START-UP PROCEDURE
HAS BEEN COMPLETED**

DEVICE PREFIX LOCATION CODE	
AREA	LOCATION
1	INSIDE UNIT CONTROL BOX
2	CONDENSER SECTION
3	AIR HANDLER SECTION
4	HEATING SECTION
5	EXTERNAL FIELD MOUNTED DEVICE

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SPRING DATA

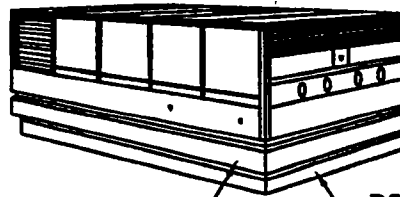
SPRING ISOLATORS ARE COMPUTER SELECTED
AND LOCATED TO PROVIDE A NOMINAL
2 INCH (50 mm) STATIC DEFLECTION.

SPRING ISOLATORS HAVE A MINIMUM K_x/K_y OF 1.0

SPRING ISOLATORS ARE SAFE AT SOLID LOADING

SPRING ISOLATORS ARE PAINTED.

ROOFTOP EQUIPMENT



ISOLATION RAIL ROOF CURB

RATED LOAD LB/KG	RATED DEFL. IN/mm	SPRING FR. HT. IN/mm	SPRING O. D. IN/mm	COLOR CODE
30/14	2.00/50	3.75/95	1.46/37	GRAY
65/30	2.00/50	3.75/95	1.46/37	BLUE
120/55	2.00/50	3.75/95	1.46/37	GREEN
205/93	2.00/50	3.75/95	1.46/37	BLACK

SPECIAL NOTE:

ALL UNITS SUPPLIED WITH A
TROUBLE SHOOTING PACKAGE
FOR LEVELING EQUIPMENT,
IF REQUIRED, DURING INSTALLATION.

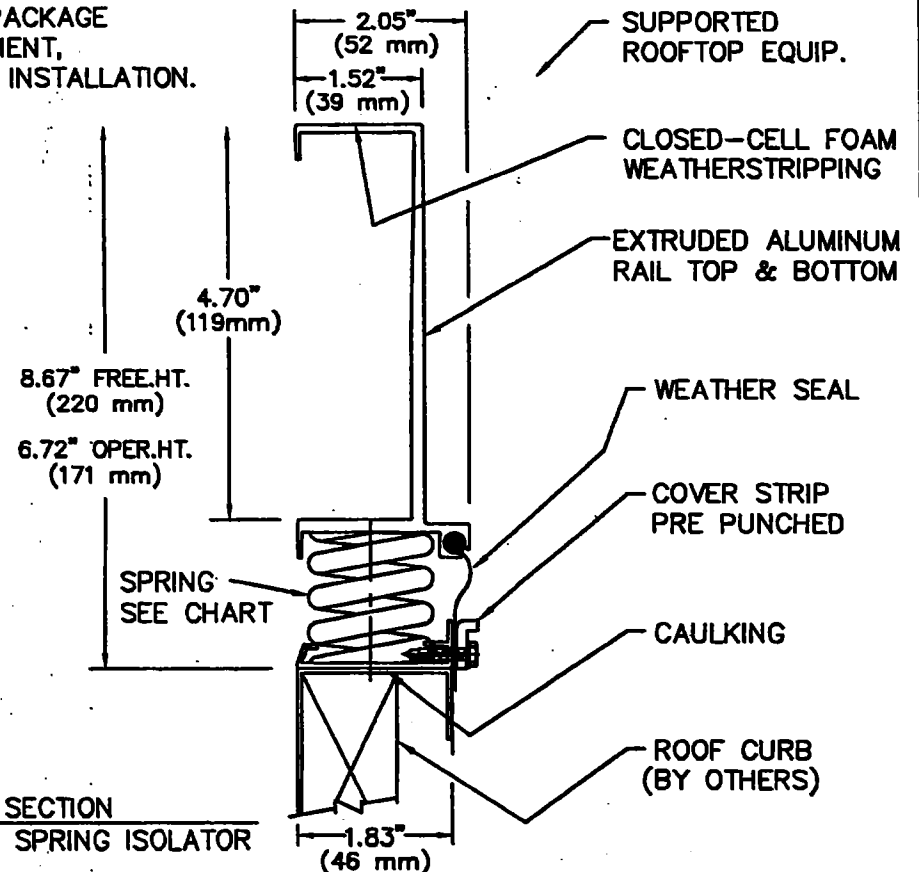
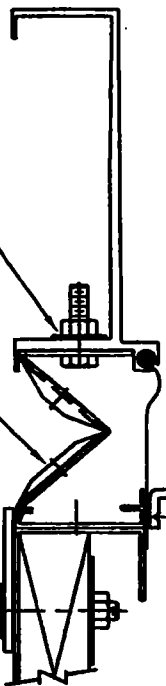
PRE PUNCHED BOLTING
HOLES IN TOP EXTRUSION
FOR HARDWARE BY KNC

WIND/SEISMIC RESTRAINT
BRACKET QUANTITY AND
LOCATION PRE-DETERMINED
BY KNC

HARDWARE BY KNC

TYPICAL SECTION
SHOWING WIND/SEISMIC RESTRAINT

NOTE:
IF SEISMIC APPLICATION IS REQUIRED
CONSULT SALES REPRESENTATIVE.



TYPICAL SECTION
SHOWING SPRING ISOLATOR



TITLE
MODEL KSR-2
ISOLATION RAIL

LAST DATE
REVISED
1/5/99

DRAWN BY
DW

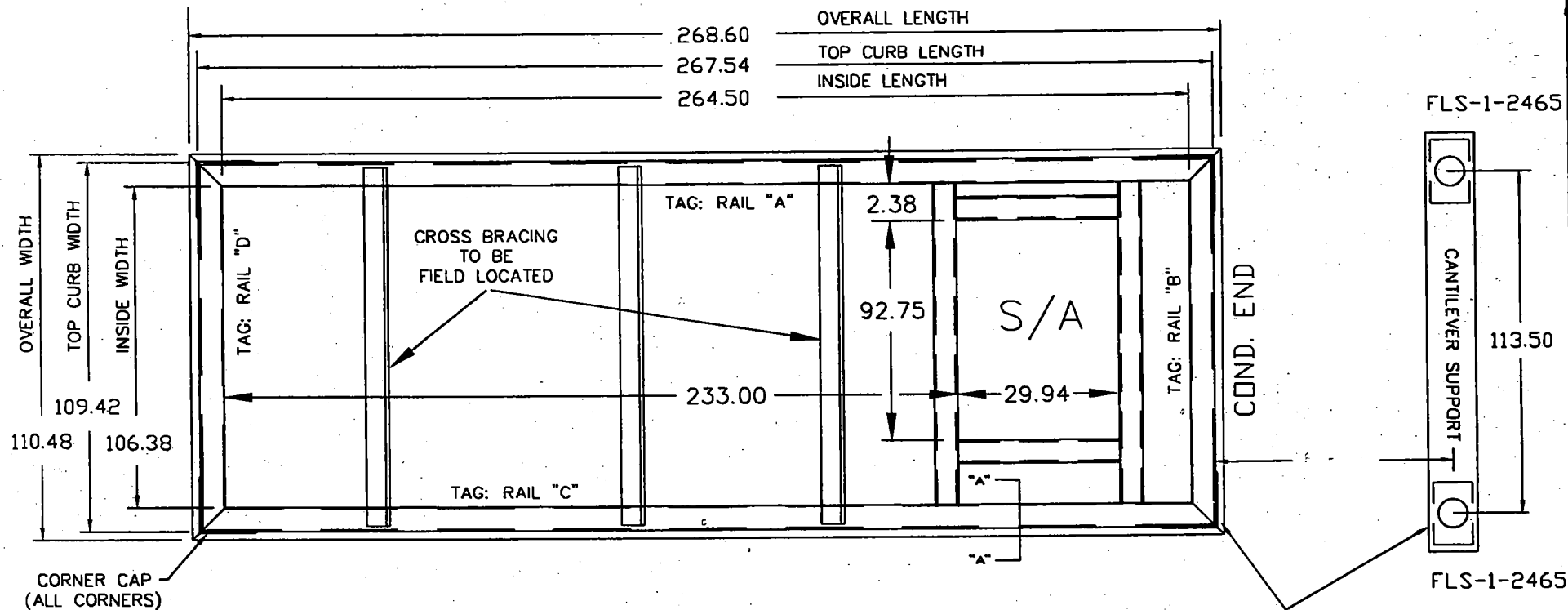
DRAWING NO.
S-88.350

S-DWG

(

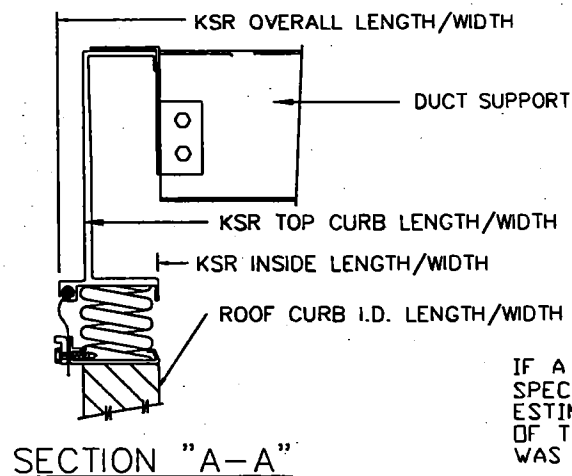
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NOTE: OPERATING HEIGHTS OF CURB AND CANTILEVER ISOLATORS MATCHED BY OTHERS.

KSR OPERATING HEIGHT OF CURB RAIL IS 6.72"



IF A SEISMIC OR WIND ANALYSIS WAS NOT PART OF THE SPEC, RESTRAINT SIZES WERE SELECTED BY OTHERS OR ESTIMATED. KNC MAKES NO CLAIMS FOR THE ADEQUACY OF THESE COMPONENTS UNLESS AN ANALYSIS BY KNC WAS REQUESTED AND IS INCLUDED.

* NOT TO SCALE *

ALL DIMENSIONS IN INCHES

MANUFACTURER:	TRANE
MODEL:	SXHF-C60
WEIGHT:	10030 LBS
DEFLECTION:	2.00 Inch Typical
ROOF CURB I.D.:	264.50 x 106.38
PO:	166-03-11
JOB:	POST AVERY MOB
ENG:	-
CON:	-



TAG:

SXHF C60

DATE

02/06/2003

DRAWN BY

J. WALTERS

DRAWING NO.

101

KNC#

22771

H & A Mechanical, Inc.**Submittal**

Date: 7/15/2010

Project: **Performing Arts Center Expansion**
Clark State Community College
275 South Limestone Ave., Springfield, OH 45505

Architect: **Lincoln Street Studio, Ltd.**
45 East Lincoln St., Columbus, OH 43215-1515
614 461-1144
614 461-8030, fax

Mechanical Engineer: **McMullen Engineering Company, Inc.**
779 Brooksedge Blvd., Westerville, OH 43081
614 895-9408
614 895-9450, fax

Contractor: **H and A Mechanical, Inc.**
P. O. Box 255, Baltimore, OH 43105
740 862-2101
740 862-2090 fax

Specification Section	Item	Manufacturer	Representative
238100	Packaged Rooftop Cooling Unit	Trane	Trane - Columbus 2300 CityGate Drive, Suite 100 Columbus, OH 43219 614-473-3500 614-473-3501, fax Brian McGann

APPROVED

H and A Mechanical, Inc.

By: *Carmela Houk*
Carmela Houk, Project Manager

Date: 7/15/2010

McMullen Engineering Co. Inc.	
REVIEW HEREBY DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR ANY DEVIATIONS FROM THE CONTRACT DOCUMENTS OR ERRORS OR OMISSIONS IN THE SHOP DRAWINGS SUBMITTED	
<input checked="checked" type="checkbox"/>	REVIEWED
<input type="checkbox"/>	REVIEWED W/COMMENTS
<input type="checkbox"/>	REVISE AND RESUBMIT
CHECKED <u><i>CH</i></u>	DATE <u><i>8/24/10</i></u>
SHOP DRAWING	

MECI JUL 21 2010

[The page contains faint, illegible markings.]



TRANE

Submittal

Prepared For:
McMullen Engineering

Date: July 06, 2010

Customer P.O. Number:
Customer Project Number:

Sold To:
H&A Mechanical

Job Number:
Job Name:
Clark State Performing Arts Center

Trane U.S. Inc. is pleased to provide the enclosed submittal for your review and approval.

Product Summary

Qty	Product
2	Unitary Cooling only Rooftop TAG: RT-2,3 Specificaliton: 238100

Brian McGann
Trane
2300 CityGate Drive, Suite 100
Columbus, OH 43219-3652
Phone: (614) 473-3500
Fax: (614) 473-3501

The attached information describes the equipment we propose to furnish for this project, and is submitted for your approval.

Table Of Contents

Product Summary 1

3-10 Ton R-410A PKGD Unitary Cooling Rooftop (Item A1)

 Tag Data3

 Product Data.....3

 Performance Data.....3

 Mechanical Specifications.....4

 Unit Dimensions.....6

 Weight, Clearance & Rigging Diagram8

 Field Wiring.....14

Field Installed Options - Part/Order Number Summary

 3-10 Ton R-410A PKGD Unitary Cooling Rooftop16

Tag Data - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop (Qty: 2)

Item	Tag(s)	Qty	Description	Model Number
A1	RTU-2, RTU-3	2	3-10 Ton Unitary Cooling Ro	TSC120E4R0B--C0B000010-00

Product Data - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop**Item: A1 Qty: 2 Tag(s): RTU-2, RTU-3**

DX cooling
 UL listed. ARI Certified
 460/60/3
 Factory charge R410a
 Microprocessor controls
 Economizer Dry Bulb 0-100%
 2' MERV 7 filters - 2 sets
 Roof curb (Fld)
 Power exhaust (Fld)
 CO2 duct mounted, sensor kit (Fld)
 Startup service

NOTE: Disconnect switch not included

Performance Data - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop

Tags	RTU-2, RTU-3
Airflow Application	Downflow
Design Airflow (cfm)	4000
Cooling Entering Dry Bulb (F)	80.00
Cooling Entering Wet Bulb (F)	67.00
Ambient Temp (F)	95.00
Gross Total Capacity (MBh)	119.00
Gross Sensible Capacity (MBh)	92.78
Gross Latent Capacity (MBh)	26.22
Design ESP (in H2O)	1.000
Component SP Add (in H2O)	0.300
Indoor Mtr. Operating Power (bhp)	2.50
Indoor RPM (rpm)	1529
Indoor Motor	3 HP
MCA (A)	24.40
MOP (A)	35.00
Evap Coil Leav Air Temp (DB) (F)	58.52
Evap Coil Leav Air Temp (WB) (F)	57.42
Exhaust fan power (kW)	0.65
ASHRAE 90.1	Yes
IEER Rating ()	12.50
EER @ ARI Conditions (EER)	11.3

Mechanical Specifications - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop**Item: A1 Qty: 2 Tag(s): RTU-2, RTU-3****General**

The units shall be convertible airflow. The operating range shall be between 115°F and 0°F in cooling as standard from the factory for units with microprocessor controls. Operating range for units with electromechanical controls shall be between 115°F and 40°F. Cooling performance shall be rated in accordance with ARI testing procedures. All units shall be factory assembled, internally wired, fully charged with R-410A, and 100 percent run tested to check cooling operation, fan and blower rotation, and control sequence before leaving the factory. Wiring internal to the unit shall be colored and numbered for simplified identification. Units shall be UL listed and labeled, classified in accordance to UL 1995/CAN/CSA No. 236-M90 for Central Cooling Air Conditioners. Canadian units shall be CSA Certified.

Casing

Unit casing shall be constructed of zinc coated, heavy gauge, galvanized steel. Exterior surfaces shall be cleaned, phosphatized, and finished with a weather-resistant baked enamel finish. Unit's surface shall be tested 672 hours in a salt spray test in compliance with ASTM B117. Cabinet construction shall allow for all maintenance on one side of the unit. All exposed vertical panels and top covers in the indoor air section shall be insulated with a cleanable foil-faced, fire-retardant permanent, odorless glass fiber material. All insulation edges shall be either captured or sealed. The unit's base pan shall have no penetrations within the perimeter of the curb other than the raised 1 1/8" high downflow supply/return openings to provide an added water integrity precaution, if the condensate drain backs up. The base of the unit shall have provisions for forklift and crane lifting, with forklift capabilities on three sides of the unit.

Unit Top

The top cover shall be one piece construction or, where seams exist, it shall be double-hemmed and gasket-sealed. The ribbed top adds extra strength and enhances water removal from unit top.

Filters

1", throwaway filters shall be standard on 3-5 ton gas electric / cooling only standard efficiency units. 2", throwaway filters shall be standard on all 6-10 Ton standard efficiency units and all high efficiency gas electric / cooling units. 2", throwaway filters shall also be standard on all 3-10 ton heat pumps.

Compressors

All units shall have direct-drive, hermetic, scroll type compressors with centrifugal type oil pumps. Motor shall be suction gas-cooled and shall have a voltage utilization range of plus or minus 10 percent of unit nameplate voltage. Internal overloads shall be provided with the scroll compressors. Crankcase heaters shall be included.

Refrigerant Circuits

Service pressure ports, and refrigerant line filter driers are factory-installed as standard. An area shall be provided for replacement suction line driers.

Evaporator and Condenser Coils

Internally finned, 5/16" copper tubes mechanically bonded to a configured aluminum plate fin shall be standard. Coils shall be leak tested at the factory to ensure the pressure integrity. The evaporator coil and condenser coil shall be leak tested at 600 psig. The assembled unit shall be leak tested to 465 psig. The condenser coil shall have a patent pending 1+1+1 hybrid coil designed with slight gaps for ease of cleaning. A removable, reversible, double-sloped condensate drain pan with provision for through the base condensate drain is standard.

Outdoor Fans

The outdoor fan shall be direct-drive, statically and dynamically balanced, draw-through in the vertical discharge position. The fan motor shall be permanently lubricated and shall have built-in thermal overload protection.

Controls

Unit shall be completely factory-wired with necessary controls and contactor pressure lugs or terminal block for pot wiring. Unit shall provide an external location for mounting a fused disconnect device. A choice of microprocessor or electromechanical controls shall be available. Microprocessor controls provide for volt control functions. The resident control algorithms shall make all heating, cooling, and/or ventilating decisions in response to electronic signals from

sensors measuring indoor and outdoor temperatures. The control algorithm maintains accurate temperature control, minimizes drift from set point, and provides better building comfort. A centralized Microprocessor shall provide anti-short cycle timing and time delay between compressors to provide a higher level of machine protection.

Two-Inch Pleated Filters

Two inch pleated media filters shall be available on all models.

Economizer

This accessory shall be available with or without barometric relief. The assembly includes fully modulating 0-100 percent motor and dampers, minimum position setting, preset linkage, wiring harness with plug, spring return actuator and fixed dry bulb control. The barometric relief shall provide a pressure operated damper that shall be gravity closing and shall prohibit entrance of outside air during the equipment off cycle. Optional solid state or differential enthalpy control shall be available for either factory or field installation. The economizer arrives in the shipping position and shall be moved to the operating position by the installing contractor.

Trane Communication Interface

This option shall be provided to interface ReliaTel controlled units with the Trane Integrated Comfort systems.

CO2 Sensing

The CO2 sensor shall have the ability to monitor space occupancy levels within the building by measuring the parts per million of CO2 (Carbon Dioxide) in the air. As the CO2 levels increase, the outside air damper modulates to meet the CO2 space ventilation requirements.

Powered Exhaust

The powered exhaust, shall provide exhaust of return air, when using an economizer, to maintain better building pressurization.

Roof Curb

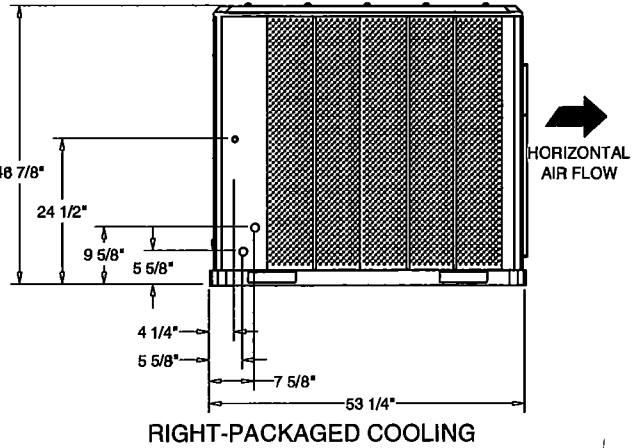
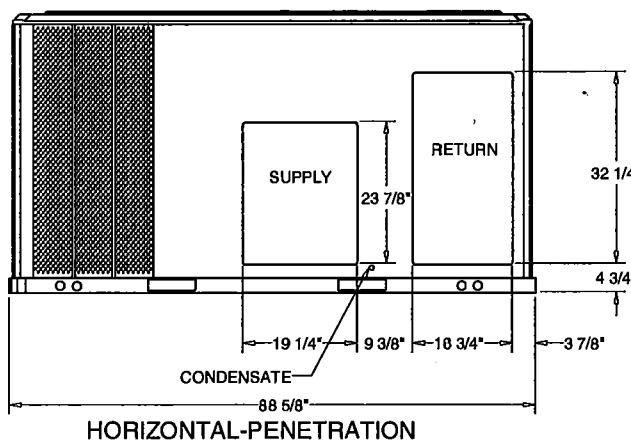
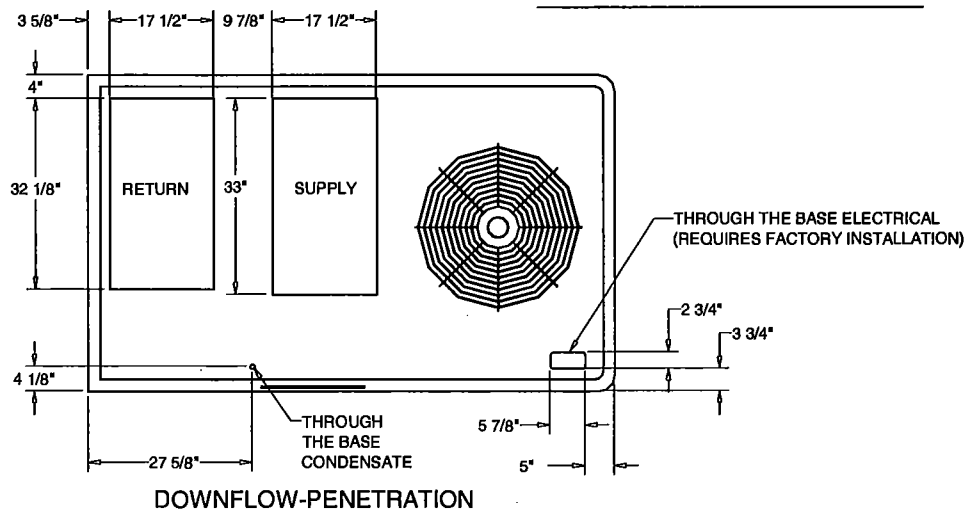
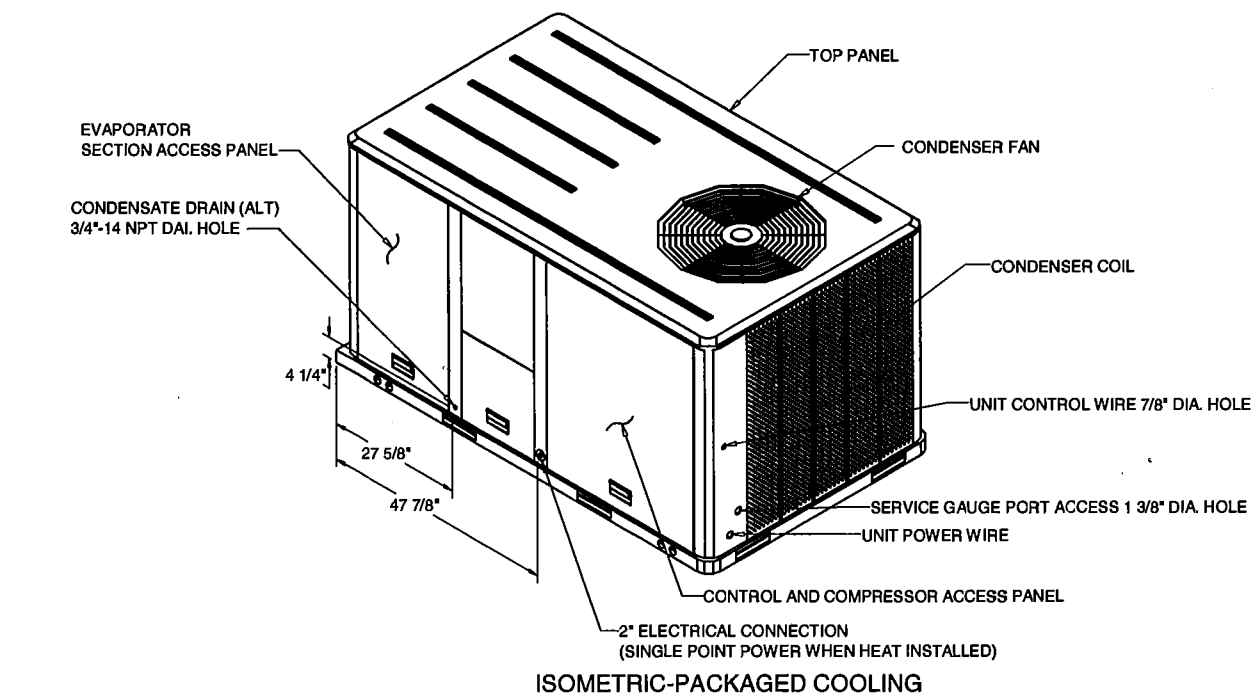
The roof curb shall be designed to mate with the unit's downflow supply and return and provide support and a water tight installation when installed properly. The roof curb design shall allow field fabricated rectangular supply/return ductwork to be connected directly to the curb. Curb design shall comply with NRCA requirements. Curb shall be shipped knocked down for field assembly and shall include wood nailer strips.

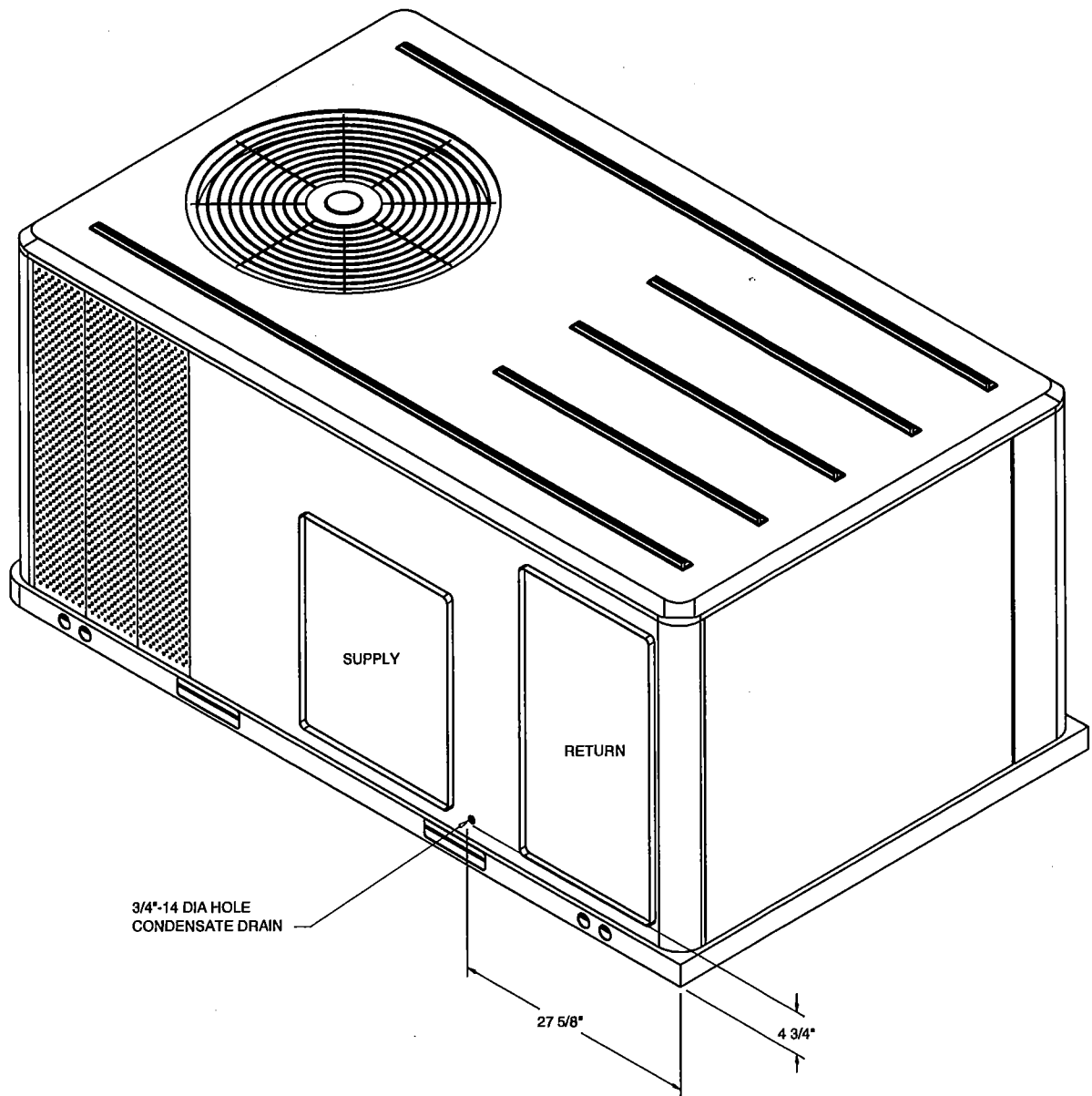
Zone Sensor

This control shall be provided to interface with the Micro equipped units and shall be available in either manual, automatic programmable with night setback, with system malfunction lights, or remote sensor options.

Plenum Fan

The following unit shall be equipped with a direct drive plenum fan design (all 10 tons and 7.5-8.5 ton high efficiency units). Plenum fan design shall include a backward-curved fan wheel along with an external rotor direct drive variable speed indoor motor. All plenum fan designs will have a variable speed adjustment potentiometer located in the control box.

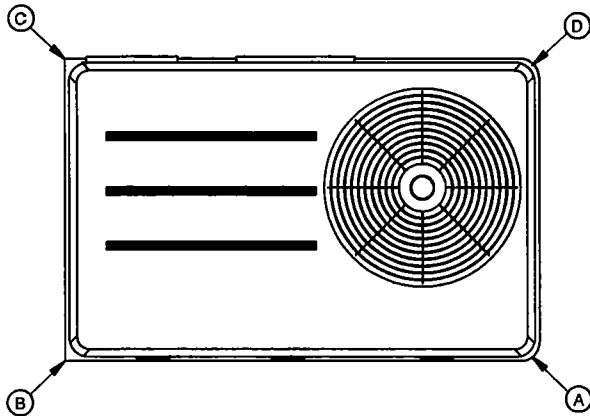
Unit Dimensions - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop**Item: A1 Qty: 2 Tag(s): RTU-2, RTU-3**

Unit Dimensions - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop**Item: A1 Qty: 2 Tag(s): RTU-2, RTU-3**

ISOMETRIC-PACKAGED COOLING

Weight, Clearance & Rigging Diagram - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop

Item: A1 Qty: 2 Tag(s): RTU-2, RTU-3



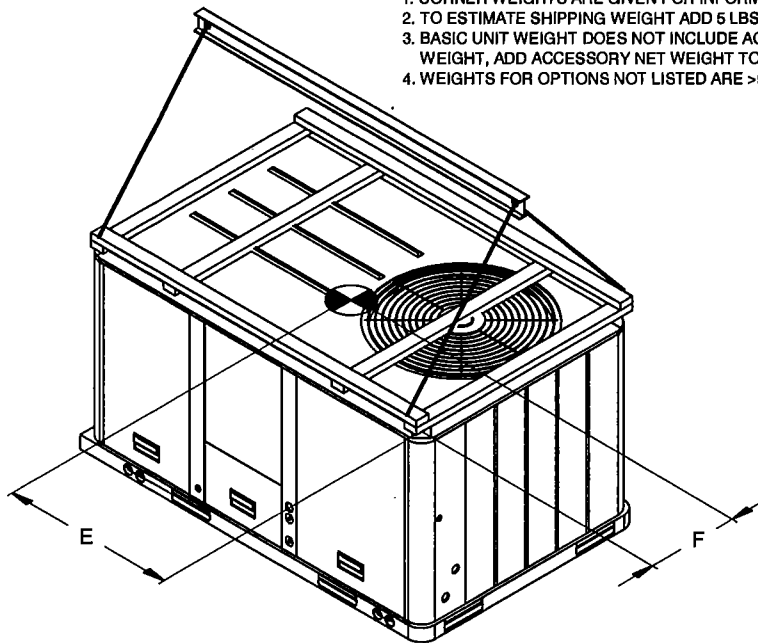
PACKAGED COOLING
CORNER WEIGHT

INSTALLED ACCESSORIES NET WEIGHT DATA

ACCESSORY						WEIGHTS	
ECONOMIZER						38.0 lb	
MOTORIZED OUTSIDE AIR DAMPER							
MANUAL OUTSIDE AIR DAMPER							
BAROMETRIC RELIEF							
OVERSIZED MOTOR							
BELT DRIVE MOTOR							
POWER EXHAUST						80.0 lb	
HEATER							
REHEAT							
THROUGH THE BASE ELECTRICAL (FIOPS)							
UNIT MOUNTED CIRCUIT BREAKER (FIOPS)							
UNIT MOUNTED DISCONNECT (FIOPS)							
POWERED CONVENIENCE OUTLET (FIOPS)							
HINGED DOORS (FIOPS)							
HAIL GUARD							
SMOKE DETECTOR, SUPPLY / RETURN							
NOVAR CONTROL							
ROOF CURB						78.0 lb	
BASIC UNIT WEIGHTS		CORNER WEIGHTS				CENTER OF GRAVITY	
SHIPPING	NET	(A)	312.0 lb	(C)	206.0 lb	(E) LENGTH	(F) WIDTH
1123.0 lb	1025.0 lb	(B)	260.0 lb	(D)	247.0 lb	40"	24"

NOTE:

1. CORNER WEIGHTS ARE GIVEN FOR INFORMATION ONLY.
2. TO ESTIMATE SHIPPING WEIGHT ADD 5 LBS TO NET WEIGHT.
3. BASIC UNIT WEIGHT DOES NOT INCLUDE ACCESSORY WEIGHT. TO OBTAIN TOTAL WEIGHT, ADD ACCESSORY NET WEIGHT TO BASIC UNIT WEIGHT.
4. WEIGHTS FOR OPTIONS NOT LISTED ARE >5 LBS.



PACKAGED COOLING
RIGGING AND CENTER OF GRAVITY

Weight, Clearance & Rigging Diagram - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop
Item: A1 Qty: 2 Tag(s): RTU-2, RTU-3

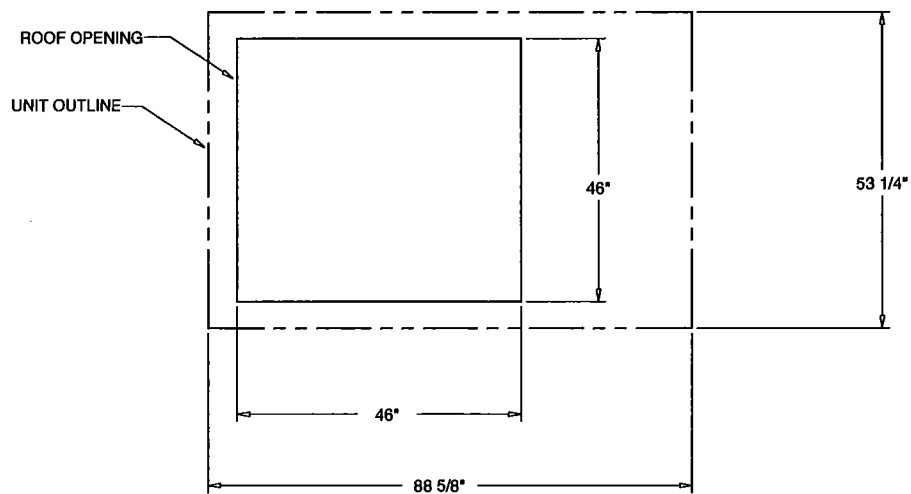
CLEARANCE 36"

CLEARANCE FROM TOP OF UNIT 72"

CLEARANCE 48"

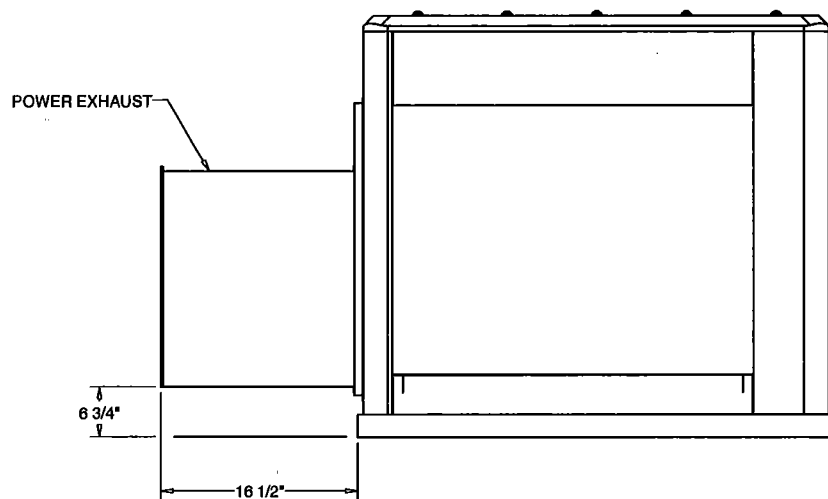
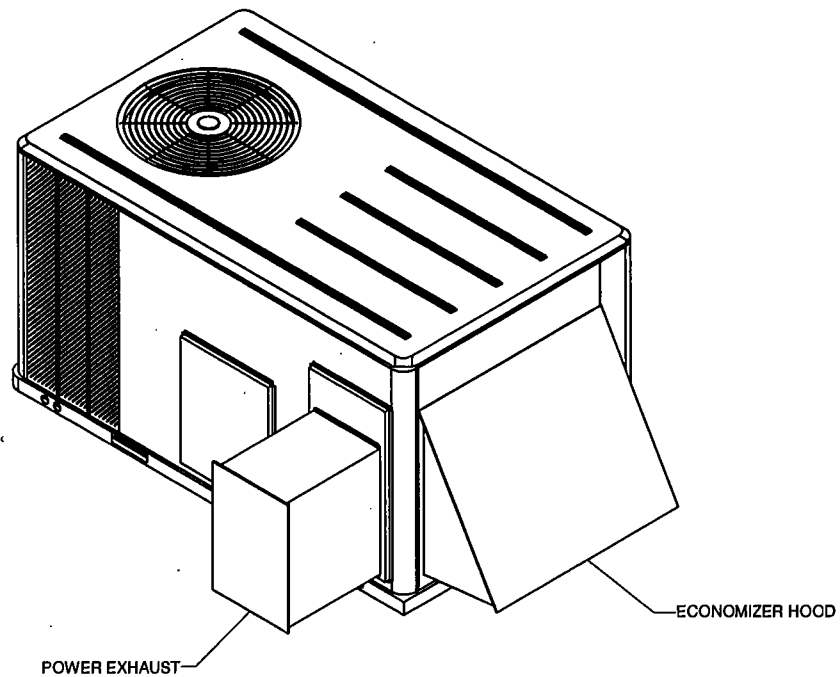
DOWNFLOW CLEARANCE 36"
HORIZONTAL CLEARANCE 18"

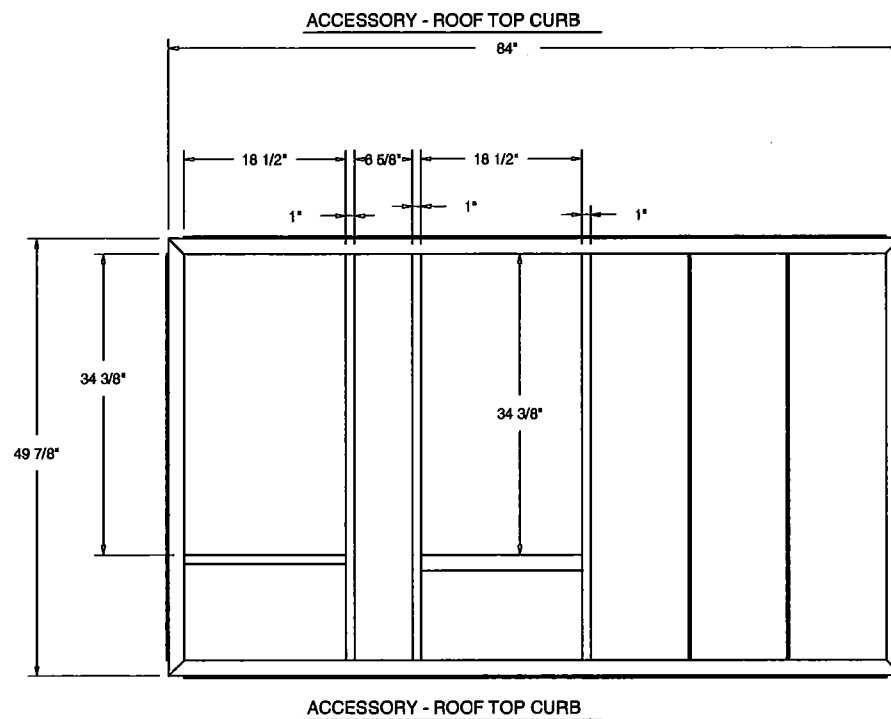
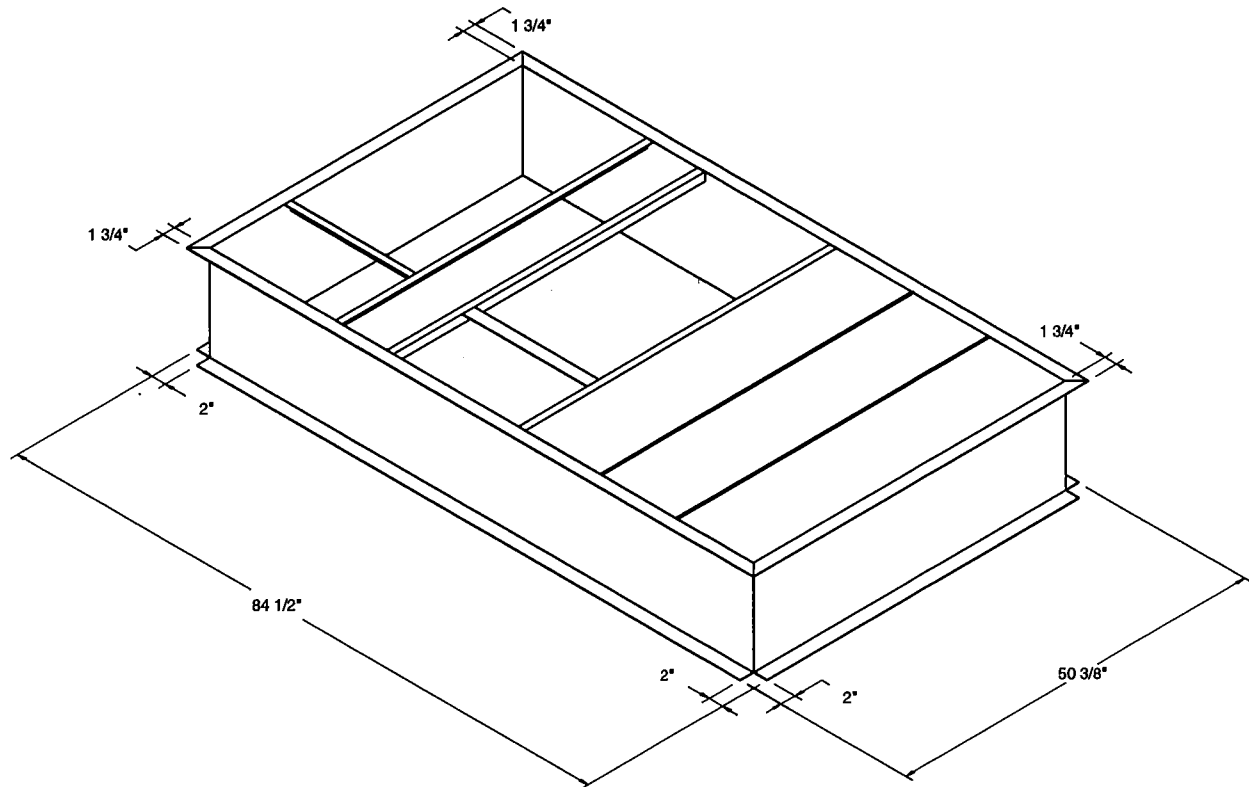
CLEARANCE 36"

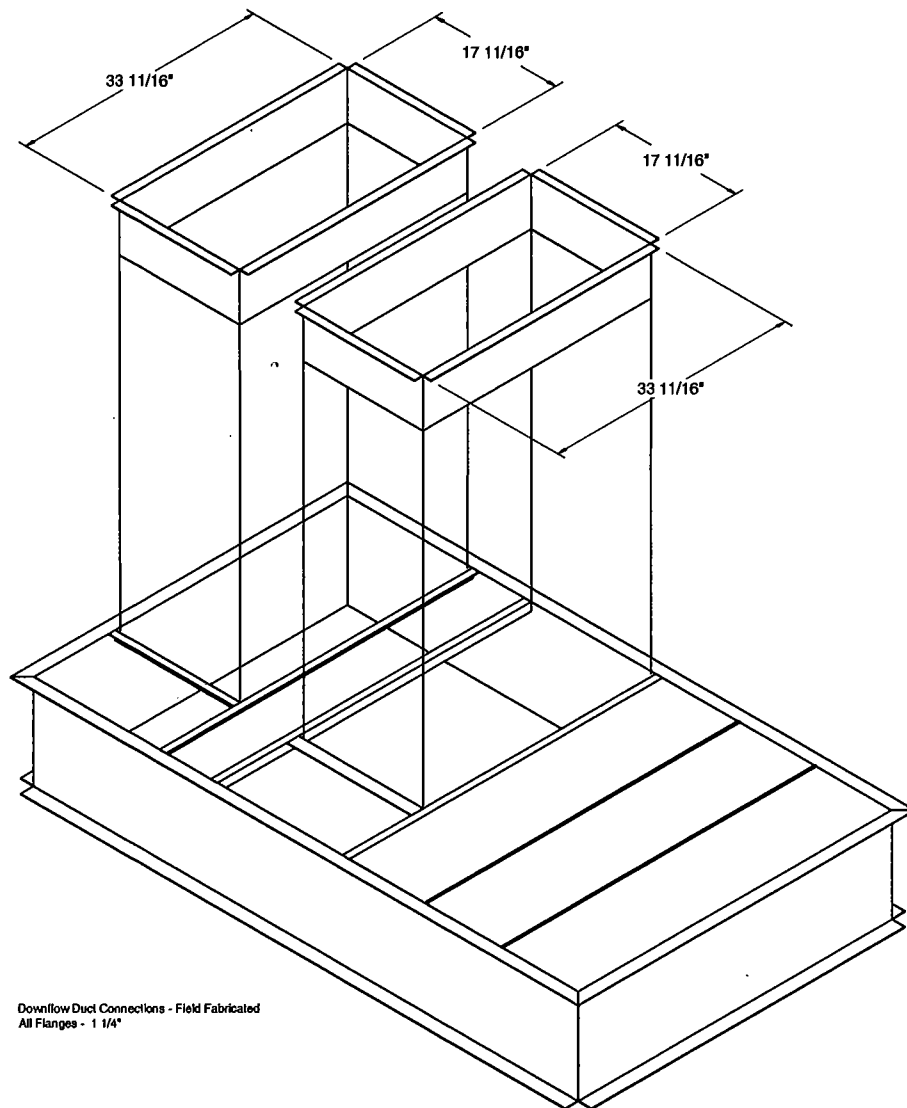
PACKAGED COOLING CLEARANCEDOWNFLOW-PACKAGED COOLING CLEARANCE

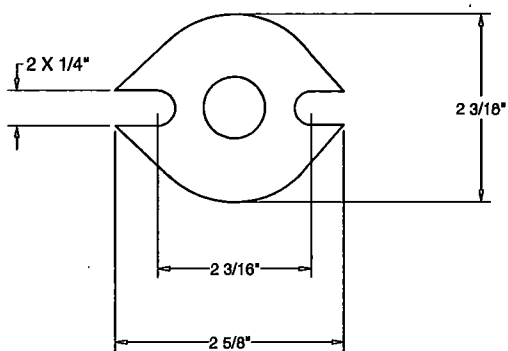
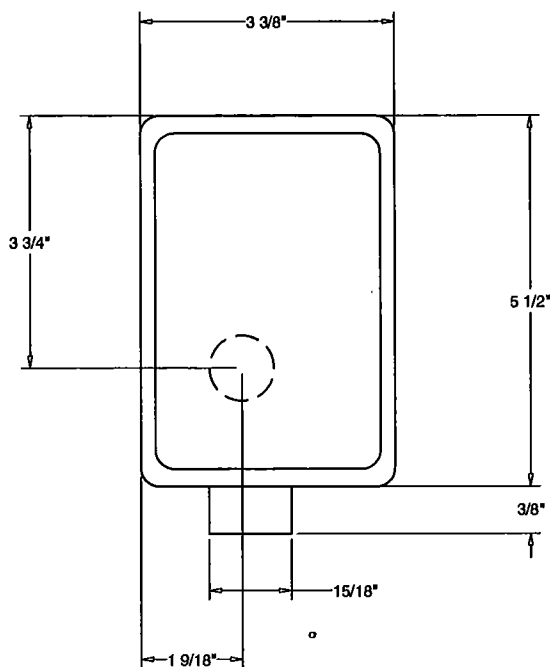
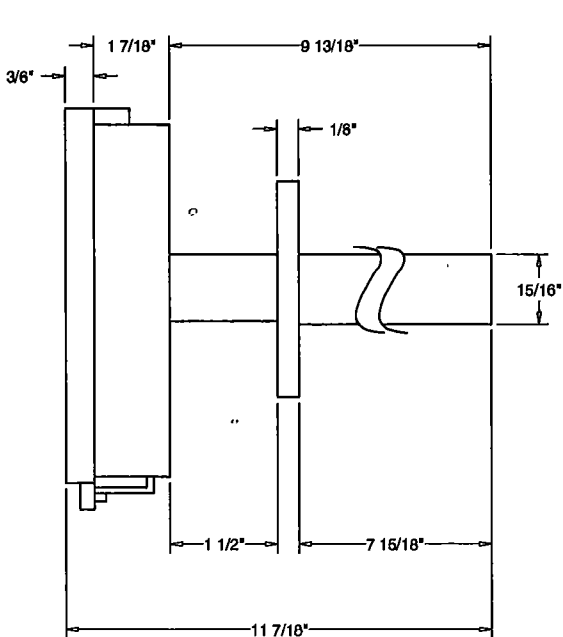
Accessory - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop

Item: A1 Qty: 2 Tag(s): RTU-2, RTU-3

ACCESSORY - ECONOMIZER HOOD

Accessory - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop**Item: A1 Qty: 2 Tag(s): RTU-2, RTU-3**

Accessory - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop**Item: A1 Qty: 2 Tag(s): RTU-2, RTU-3**ACCESSORY - DUCT CONNECTIONS

Accessory - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop**Item: A1 Qty: 2 Tag(s): RTU-2, RTU-3**

MOUNTING PLATE

NOTES:

1. SEE ENGINEERING SPECIFICATION FOR DETAILS.
2. VERIFY ALL DIMENSION WITH INSTALLER DOCUMENTS BEFORE INSTALLATION.

BAYCO2K003B - DUCT MOUNT CO2

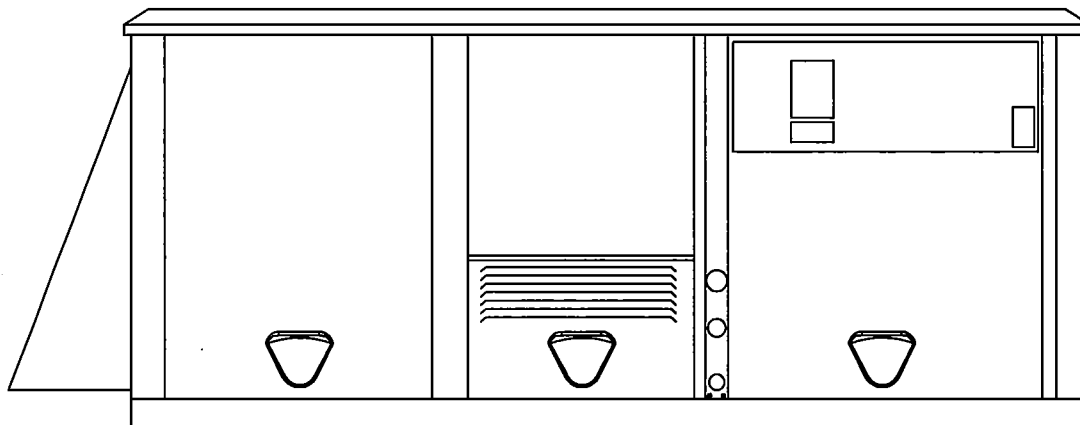
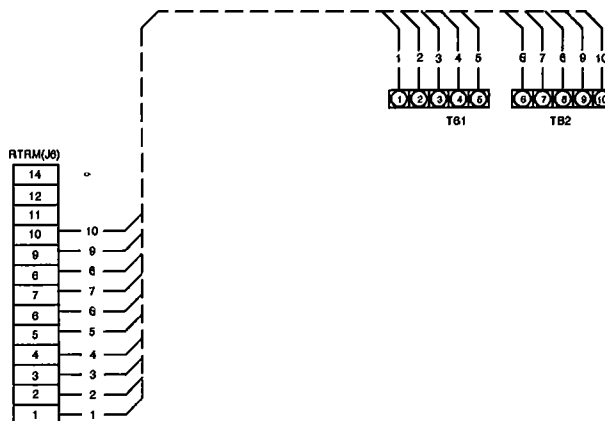
ACCESSORY

Field Wiring - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop

Item: A1 Qty: 2 Tag(s): RTU-2, RTU-3

6AYSENS010/110
 ZONE SENSOR
 DUAL SETPOINT MANUAL/AUTO CHANGE OVER
 WITH INDICATOR LIGHTS
 FAN AUTO - FAN ON
 HEAT - AUTO - OFF - COOL

2



ZONE SENSOR WIRE TABLE

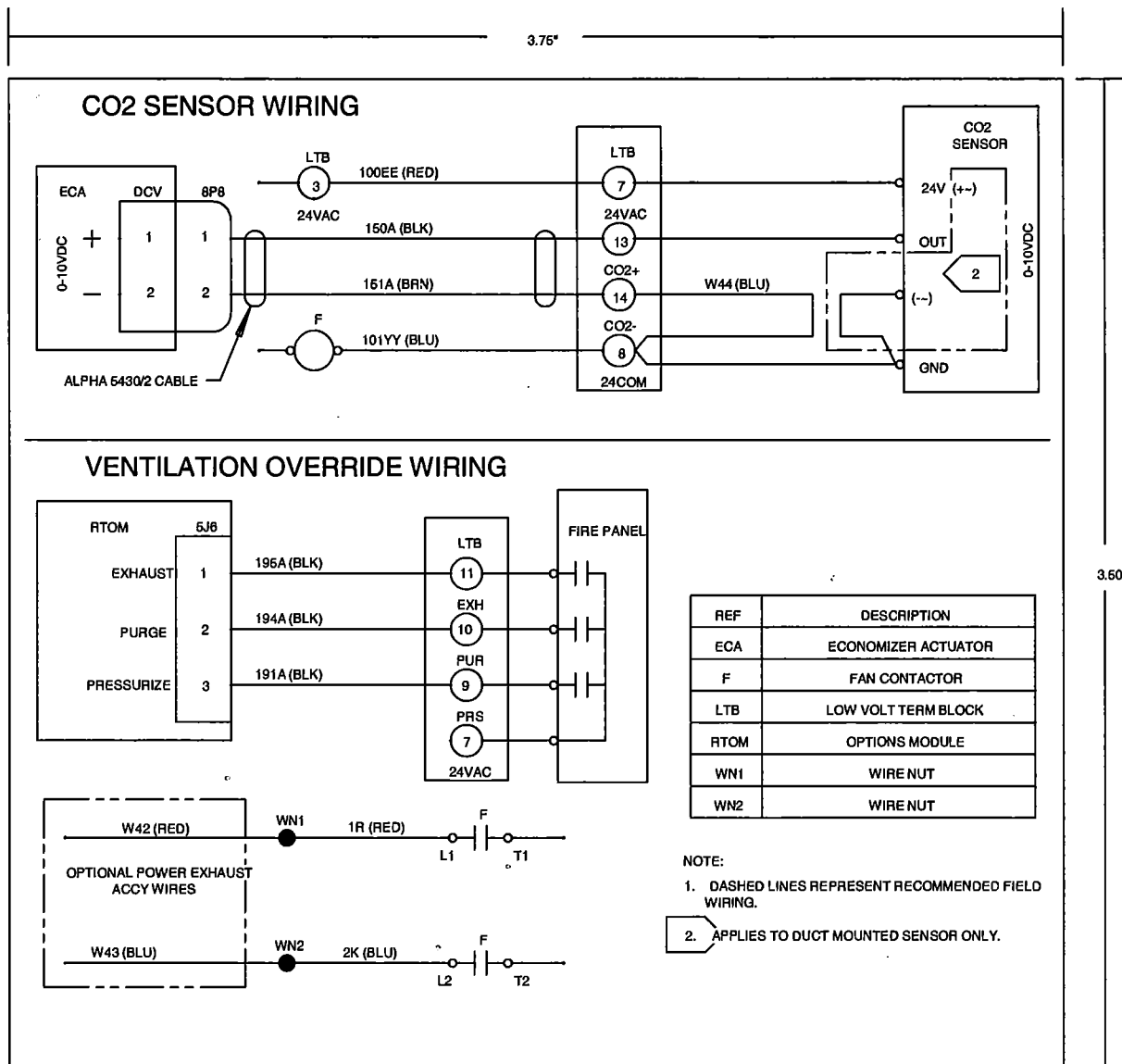
WIRE SIZE	MAXIMUM WIRE LENGTH
22 GAUGE	1800'
20 GAUGE	3000'
18 GAUGE	4500'
18 GAUGE	7200'
14 GAUGE	11700'

NOTE:

1. All wiring and devices shown dashed to be supplied and installed by the customer in accordance with national and local electrical codes.
2. Low voltage control wiring must not be run in conduit with power wiring.
3. Cut wire jumper adjacent to the terminal 1 on zone sensor.
4. Refer to zone sensor installer's guide for zone sensor switch configuration.

Field Wiring - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop

Item: A1 Qty: 2 Tag(s): RTU-2, RTU-3



NOTES:

- PRINT ON STRIP-TAC PLUS WITH BLACK LETTERS
- REDUCE TRIMMED LABEL TO SIZE INDICATED.

Field Installed Options - Part/Order Number Summary

This is a report to help you locate field installed options that arrive at the jobsite. This report provides part or order numbers for each field installed option, and references it to a specific product tag. It is NOT intended as a bill of material for the job.

Product Family - 3-10 Ton R-410A PKGD Unitary Cooling Rooftop

Item	Tag(s)	Qty	Description	Model Number
A1	RTU-2, RTU-3	2	3-10 Ton R-410A PKGD Unitary Cooling Ro	TSC120E4R0B--C0B000010-00

Field Installed Option Description	Part/Ordering Number
Dual setpoint manual/auto with system lights sensor	BAYSENS110A
Roof curb	BAYCURB043A
Power exhaust	BAYPWRX027A
CO2 duct mounted, sensor kit	BAYCO2K003B

H & A Mechanical, Inc.

Submittal

Date: 9/2/10

Project: **Performing Arts Center Expansion**
Clark State Community College
275 South Limestone Ave., Springfield, OH 45505

Architect: **Lincoln Street Studio, Ltd.**
45 East Lincoln St., Columbus, OH 43215-1515
614 461-1144
614 461-8030, fax

Mechanical Engineer: **McMullen Engineering Company, Inc.**
779 Brooksedge Blvd., Westerville, OH 43081
614 895-9408
614 895-9450, fax

Contractor: **H and A Mechanical, Inc.**
P. O. Box 255, Baltimore, OH 43105
740 862-2101
740 862-2090 fax

Specification Section	Item	Manufacturer	Representative
238129	Split System Unit	Mitsubishi	Trane - Columbus 2300 CityGate Drive, Suite 100 Columbus, OH 43219 614-473-3500 614-473-3501 fax Brian McGann

APPROVED

H and A Mechanical, Inc.

By: *Carmela Houk*
Carmela Houk, Project Manager

Date: 9/2/10

McMullen Engineering Co. Inc.	
REVIEW HEREBY DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR ANY DEVIATIONS FROM THE CONTRACT DOCUMENTS OR ERRORS OR OMISSIONS IN THE SHOP DRAWINGS SUBMITTED	
<input type="checkbox"/>	REVIEWED
<input checked="" type="checkbox"/>	REVIEWED W/COMMENTS
<input type="checkbox"/>	REVISE AND RESUBMIT
CHECKED <u>4/7</u>	DATE <u>9/13/10</u>
SHOP DRAWING	

-COORDINATE ELECTRIC WITH B-C.

MECH SEP 09 2010



TRANE

Submittal

Prepared For:
McMullen Engineering

Date: September 2, 2010

Sold To:
H & A Mechanical

Job Name:
Clark State Performing Arts Center

Trane U.S. Inc. is pleased to provide the enclosed submittal for your review and approval.

Product Summary

Qty	Product
2	Mitsubishi Ductless Mini-Splits (AC-1,2/CU-1,2 – Specification Section 238129)

The attached information describes the equipment we propose to furnish for this project, and is submitted for your approval.

Brian McGann
Trane
2300 CityGate Drive, Suite 100
Columbus, OH 43219-3652
Phone: (614) 473-3500
Fax: (614) 473-3501



HVAC Advanced Products Division

Mr. SLIM.

Split-ductless A/C and Heat Pumps

SUBMITTAL DATA: PKA-A12HA & PUY-A12NHA3

12,000 BTU/H WALL-MOUNTED AIR-CONDITIONING SYSTEM

Job Name: CLARK STATE PAC

Location: SPRINGFIELD, OH Date: 9/2/10

Purchaser: H&A MECHANICAL

Engineer: CARL M. MULLEN

Submitted to: M. MULLEN ENGINEERING For ☐ Reference ☒ Approval ☐ Construction

Unit Designation: AC-1/CU-1

Schedule No.:

GENERAL FEATURES

- Wall-mounted indoor unit for residential and commercial applications
- Shiny-white exterior plastic; compact design
- Quiet operation—both indoor and outdoor units
- PAR-21MAA wired remote controller is included
- Self-check function—integrated diagnostics
- Limited warranty: five years on parts and defects and seven years on compressors

OPTIONAL ACCESSORIES

Indoor Unit

- Remote Temperature Sensor (PAC-SE41TS-E)

Outdoor Unit

- M-NET Adapter (PAC-SF81MA-E)
- Air Outlet Guide (PAC-SG58SG-E)
- Wind Baffle (WB-PA1)

Cooling*

Rated Capacity 12,000 Btu/h
Minimum Capacity 6,000 Btu/h
SEER 15.2
Total Input 1,190 W

* Rating Conditions (Cooling) - Indoor: 80°F (27°C) DB / 67°F (19°C) WB.
Outdoor: 95°F (35°C) DB / 75°F (24°C) WB.

Electrical Requirements

Power Supply 208 / 230V, 1-Phase, 60 Hz
Breaker Size 15 A

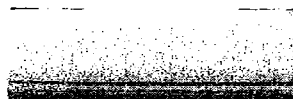
Voltage

Indoor - Outdoor S1-S2 AC 208 / 230V
Indoor - Outdoor S2-S3 DC 24V
Indoor - Remote Controller DC 12V

OPERATING RANGE

	Indoor Intake Air Temp.	Outdoor Intake Air Temp.
Cooling	Maximum 95°F (35°C) DB, 71°F (22°C) WB	115°F (46°C) DB
	Minimum 67°F (19°C) DB, 57°F (14°C) WB	0°F** (-18°C) DB

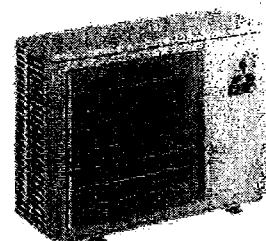
** With optional wind baffle accessory installed. If not installed, the minimum temperature will be 23°F (-5°C) DB.



Indoor Unit: PKA-A12HA



Remote Controller:
PAR-21MAA



Outdoor Unit: PUY-A12NHA3

Indoor Unit

MCA 1 A
Fan Motor 0.33 F.L.A.
Fan Motor Output 30 W
Airflow (Lo - Mid - Hi) 320 - 370 - 425 Dry CFM
290 - 335 - 380 Wet CFM
Air Filter Polypropylene Honeycomb
Sound Pressure Level (Lo - Mid - Hi) 36 - 40 - 43 dB(A)

DIMENSIONS	UNIT INCHES / MM
W	35-3/8 / 898
D	9-13/16 / 249
H	11-5/8 / 295

Weight 29 lbs. / 13 kg
External Finish Munsell No. 1.0Y 9.2 / 0.2
Field Drainpipe Size O.D. 5/8" / 16 mm
Wall-mounted Remote Controller PAR-21MAA
(See Data Submittal Sheet)

Outdoor Unit

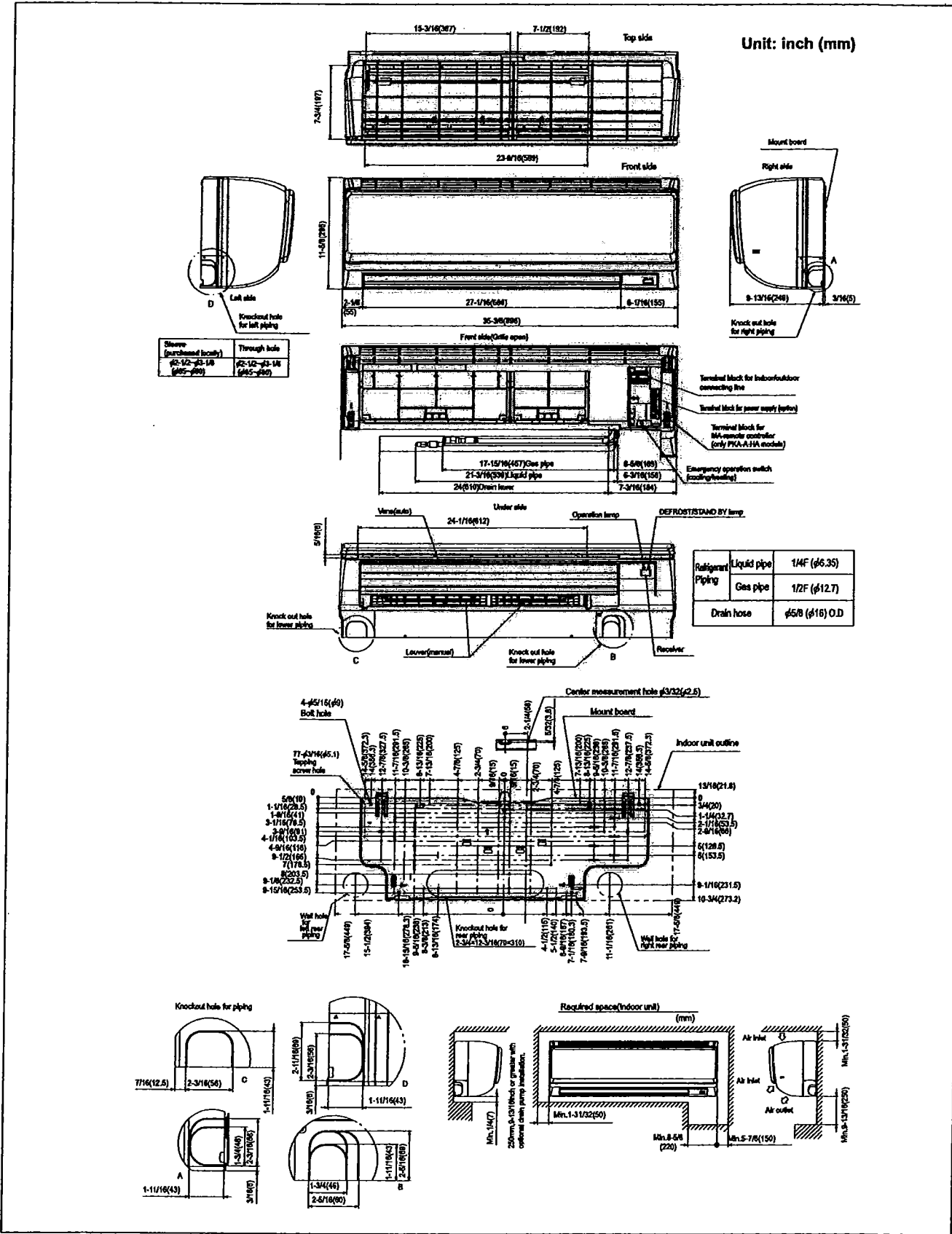
Compressor DC Inverter-driven Twin Rotary
MCA 13 A
Fan Motor 0.35 F.L.A.
Sound Pressure Level
Cooling 46 dB(A)

DIMENSIONS	INCHES / MM
W	31-1/2 / 800
D	13 + 7/8 / 330 + 23
H	23-5/8 / 600

Weight 90 lbs. / 41 kg
External Finish Munsell No. 3Y 7.8 / 1.1
Refrigerant Type R410A
Refrigerant Pipe Size O.D.
Gas Side 1/2" / 12.7 mm
Liquid Side 1/4" / 6.35 mm
Max. Refrigerant Pipe Length 100' / 30 m
Max. Refrigerant Pipe Height Difference 100' / 30 m
Connection Method Flared

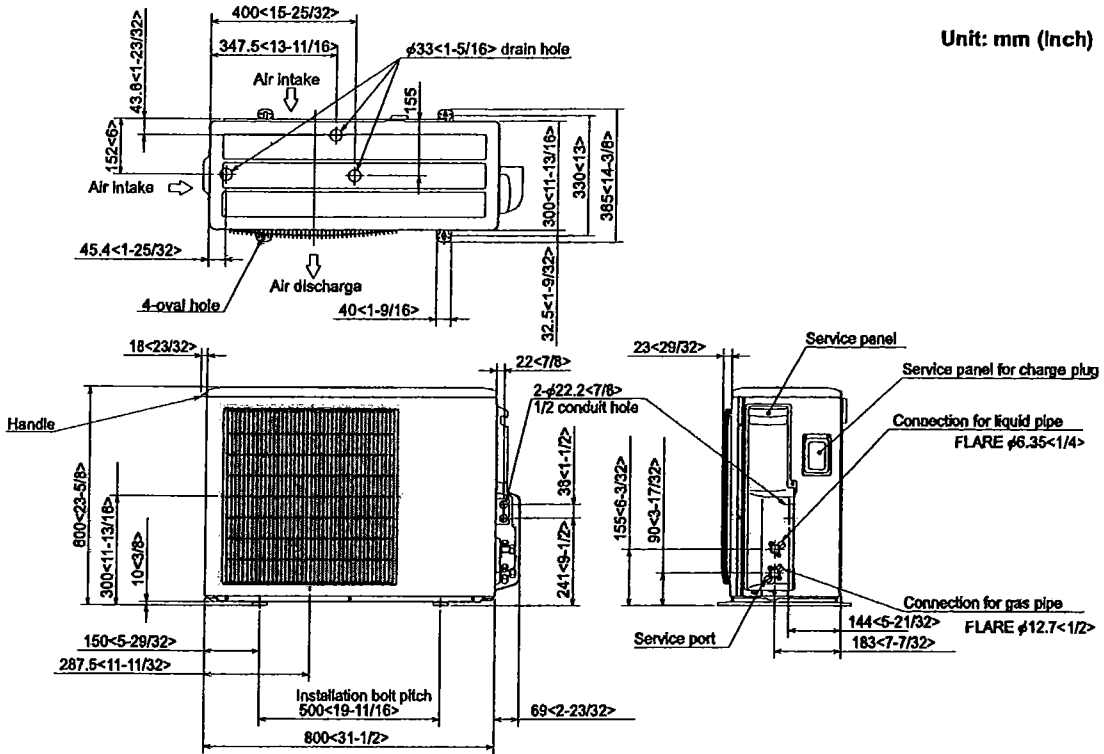


DIMENSIONS: PKA-A12HA

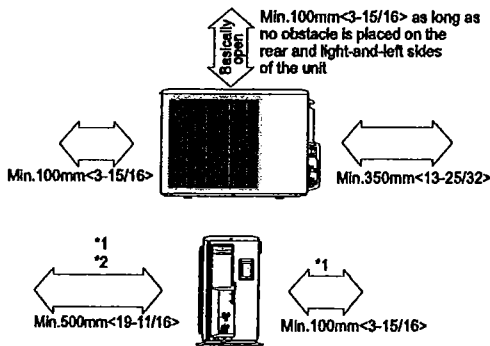


DIMENSIONS: PUY-A12NHA3

Unit: mm (Inch)



Clearance space around the outdoor unit



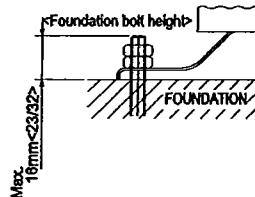
2 slides should be open in the right, left and rear side.

Minimum installation space for outdoor unit

- *1 In the place where short cycle tends to occur, cooling and heating capacity and power consumption might get lowered 10%.
Air outlet guide (optional) will help them improve.
*2 If air discharges to the wall, the surface might get stained.

FOUNDATION BOLTS

Please secure the unit firmly with 4 foundation M10<W3/8> bolts. (Bolts, washers and nut must be purchased locally.)



PIPING-WIRING DIRECTION

Piping and wiring connection can be made from the rear direction only.



mitsubishi
ELECTRIC

HVAC Advanced Products Division

3400 Lawrenceville Suwanee Rd

Suwanee, GA 30024

Tele: 678-376-2900 • Fax: 800-889-9904

Toll Free: 800-433-4822 (#3)

www.mehvac.com

Specifications are subject to change without notice.



HVAC Advanced Products Division

Mr. SLIM.

Split-ductless A/C and Heat Pumps

SUBMITTAL DATA: PKA-A18HA & PUY-A18NHA3

18,000 BTU/H WALL-MOUNTED AIR-CONDITIONING SYSTEM

Job Name: CLARK STATE PAC

Location: SPRINGFIELD, OH Date: 9/2/10

Purchaser: H&A MECHANICAL

Engineer: CARL McMULLEN

Submitted to: McMULLEN ENGINEERING

For ☐ Reference ☒ Approval ☐ Construction

Unit Designation: AC-2 / CU-2

Schedule No.:

GENERAL FEATURES

- Wall-mounted indoor unit for residential and commercial applications
- Shiny-white exterior plastic; compact design
- Quiet operation—both indoor and outdoor units
- PAR-21MAA wired remote controller is included
- Self-check function—integrated diagnostics
- Limited warranty: five years on parts and defects and seven years on compressors

OPTIONAL ACCESSORIES

Indoor Unit

- Remote Temperature Sensor (PAC-SE41TS-E)

Outdoor Unit

- M-NET Adapter (PAC-SF81MA-E)
- Air Outlet Guide (PAC-SG58SG-E)
- Wind Baffle (WB-PA1)

Cooling*
Rated Capacity 18,000 Btu/h
Minimum Capacity 8,000 Btu/h
SEER 15.3 Btu/h/W
Total Input 2,240 W
* Rating Conditions (Cooling) - Indoor: 80°F (27°C) DB / 67°F (19°C) WB.
Outdoor: 95°F (35°C) DB / 75°F (24°C) WB.

Electrical Requirements

Power Supply 208 / 230V, 1-Phase, 60 Hz
Breaker Size 15 A

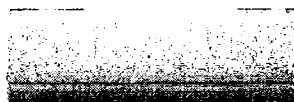
Voltage

Indoor - Outdoor S1-S2 AC 208 / 230V
Indoor - Outdoor S2-S3 DC 24V
Indoor - Remote Controller DC 12V

OPERATING RANGE

		Indoor Intake Air Temp.	Outdoor Intake Air Temp.
Cooling	Maximum	95°F (35°C) DB, 71°F (22°C) WB	115°F (46°C) DB
	Minimum	67°F (19°C) DB, 57°F (14°C) WB	0°F** (-18°C) DB

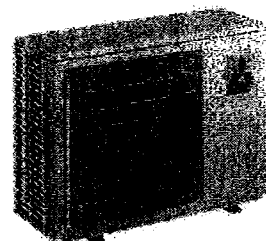
** With optional wind baffle accessory installed. If not installed, the minimum temperature will be 23°F (-5°C) DB.



Indoor Unit: PKA-A18HA



Remote Controller:
PAR-21MAA



Outdoor Unit: PUY-A18NHA3

Indoor Unit

MCA 1 A
Fan Motor 0.33 F.L.A.
Fan Motor Output 30 W
Airflow (Lo - Mid - Hi) 320 - 370 - 425 Dry CFM
290 - 335 - 380 Wet CFM
Air Filter Polypropylene Honeycomb
Sound Pressure Level (Lo - Mid - Hi) 36 - 40 - 43 dB(A)

DIMENSIONS	UNIT INCHES / MM
W	35-3/8 / 898
D	9-13/16 / 249
H	11-5/8 / 295

Weight 29 lbs. / 13 kg
External Finish Munsell No. 1.0Y 9.2 / 0.2
Field Drainpipe Size O.D. 5/8" / 16 mm
Wall-mounted Remote Controller PAR-21MAA
(See Data Submittal Sheet)

Outdoor Unit

Compressor DC Inverter-driven Twin Rotary
MCA 13 A
Fan Motor 0.35 F.L.A.
Sound Pressure Level
Cooling 46 dB(A)

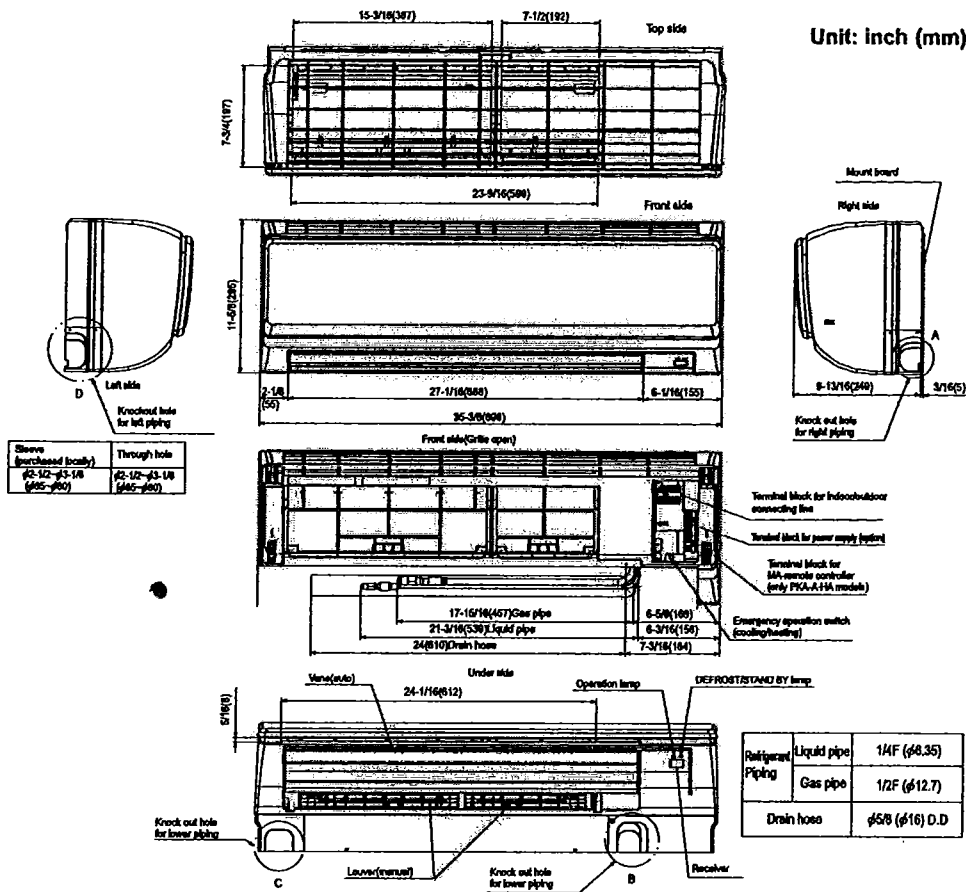
DIMENSIONS	INCHES / MM
W	31-1/2 / 800
D	13 + 7/8 / 330 + 23
H	23-5/8 / 600

Weight 97 lbs. / 44 kg
External Finish Munsell No. 3Y 7.8 / 1.1
Refrigerant Type R410A
Refrigerant Pipe Size O.D.
Gas Side 1/2" / 12.7 mm
Liquid Side 1/4" / 6.35 mm
Max. Refrigerant Pipe Length 100' / 30 m
Max. Refrigerant Pipe Height Difference 100' / 30 m
Connection Method Flared

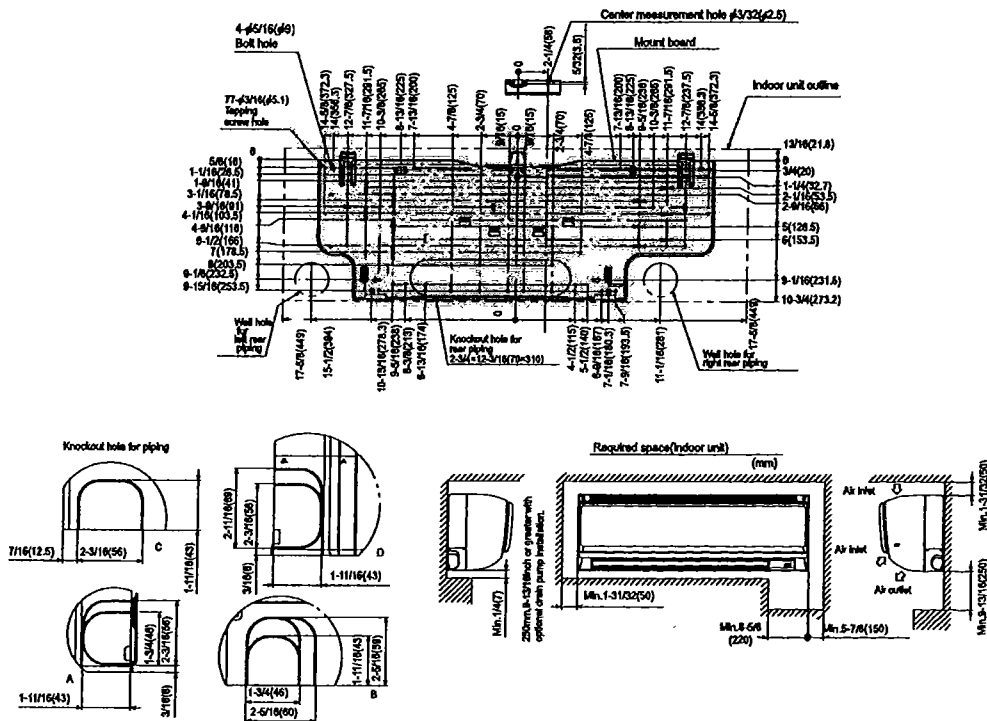


DIMENSIONS: PKA-A18HA

Unit: inch (mm)

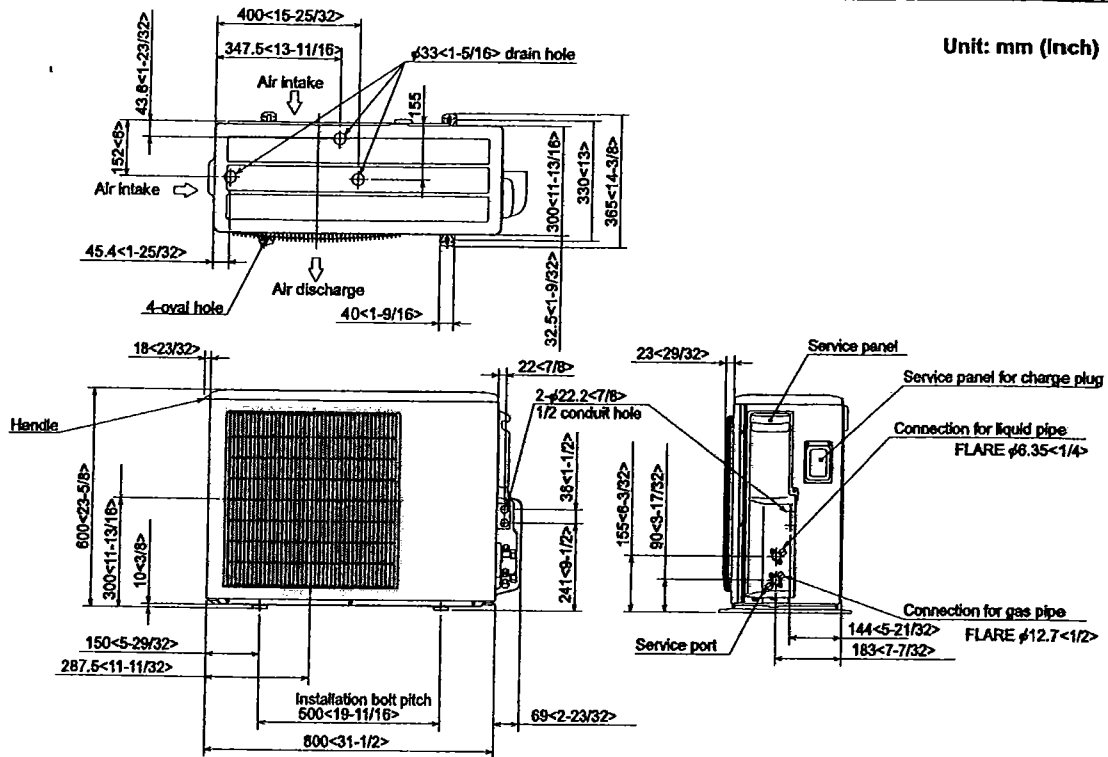


Refrigerant Piping	Liquid pipe	1/4" (ø8.35)
	Gas pipe	1/2" (ø12.7)
Drain hose		ø5/8 (ø16) D.D

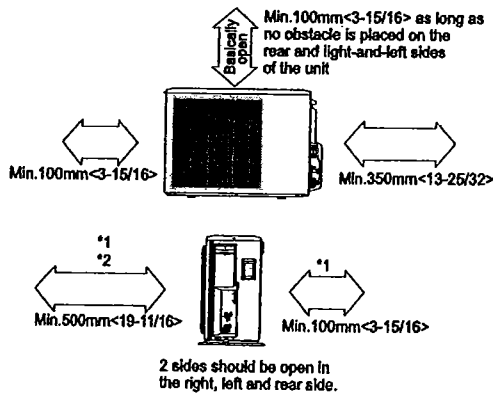


DIMENSIONS: PUY-A18NHA3

Unit: mm (inch)

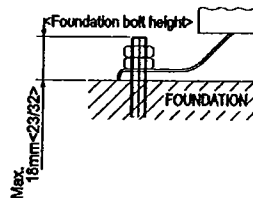


Clearance space around the outdoor unit



FOUNDATION BOLTS

Please secure the unit firmly with 4 foundation M10<W3/8> bolts. (Bolts, washers and nut must be purchased locally.)



PIPING-WIRING DIRECTION

Piping and wiring connection can be made from the rear direction only.

Minimum Installation space for outdoor unit

- *1 In the place where short cycle tends to occur, cooling and heating capacity and power consumption might get lowered 10%. Air outlet guide (optional) will help them improve.
- *2 If air discharges to the wall, the surface might get stained.



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Mercantile Customer Project Commitment Agreement
Cash Rebate Option

THIS MERCANTILE CUSTOMER PROJECT COMMITMENT AGREEMENT ("Agreement") is made and entered into by and between Ohio Edison Company, its successors and assigns (hereinafter called the "Company") and Clark State Community College, Taxpayer ID No. 34-0734597 its permitted successors and assigns (hereinafter called the "Customer") (collectively the "Parties" or individually the "Party") and is effective on the date last executed by the Parties as indicated below.

WITNESSETH

WHEREAS, the Company is an electric distribution utility and electric light company, as both of these terms are defined in R.C. § 4928.01(A); and

WHEREAS, Customer is a mercantile customer, as that term is defined in R.C. § 4928.01(A)(19), doing business within the Company's certified service territory; and

WHEREAS, R.C. § 4928.66 (the "Statute") requires the Company to meet certain energy efficiency and peak demand reduction ("EE&PDR") benchmarks; and

WHEREAS, when complying with certain EE&PDR benchmarks the Company may include the effects of mercantile customer-sited EE&PDR projects; and

WHEREAS, Customer has certain customer-sited demand reduction, demand response, or energy efficiency project(s) as set forth in attached Exhibit 1 (the "Customer Energy Project(s)") that it desires to commit to the Company for integration into the Company's Energy Efficiency & Peak Demand Reduction Program Portfolio Plan ("Company Plan") that the Company will implement in order to comply with the Statute; and

WHEREAS, the Customer, pursuant to the Public Utilities Commission of Ohio's ("Commission") September 15, 2010 Order in Case No. 10-834-EL-EEC, desires to pursue a cash rebate of some of the costs pertaining to its Customer Energy Project(s) ("Cash Rebate") and is committing the Customer Energy Project(s) as a result of such incentive.

WHEREAS, Customer's decision to commit its Customer Energy Project(s) to the Company for inclusion in the Company Plan has been reasonably encouraged by the possibility of a Cash Rebate.

WHEREAS, in consideration of, and upon receipt of, said cash rebate, Customer will commit the Customer Energy Project(s) to the Company and will comply with all other terms and conditions set forth herein.

NOW THEREFORE, in consideration of the mutual promises set forth herein, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties, intending to be legally bound, do hereby agree as follows:

1. **Customer Energy Projects.** Customer hereby commits to the Company and Company accepts for integration into the Company Plan the Customer Energy Project(s) set forth on attached Exhibit 1. Said commitment shall be for the life of the Customer Energy Project(s). Company will incorporate said project(s) into the Company Plan to the extent that such projects qualify. In so committing, and as evidenced by the affidavit attached hereto as Exhibit A, Customer acknowledges that the information provided to the Company about the Customer Energy Project(s) is true and accurate to the best of its knowledge.

- a. By committing the Customer Energy Project(s) to the Company, Customer acknowledges and agrees that the Company shall control the use of the kWh and/or kW reductions resulting from said projects for purposes of complying with the Statute. By committing the Customer Energy Project(s), Customer further acknowledges and agrees that the Company shall take ownership of the energy efficiency capacity rights associated with said Project(s) and shall, at its sole discretion, aggregate said capacity into the PJM market through an auction. Any proceeds from any such bids accepted by PJM will be used to offset the costs charged to the Customer and other of the Company's customers for compliance with state mandated energy efficiency and/or peak demand requirements
 - b. The Company acknowledges that some of Customer's Energy Projects contemplated in this paragraph may have been performed under certain other federal and/or state programs in which certain parameters are required to be maintained in order to retain preferential financing or other government benefits (individually and collectively, as appropriate, "Benefits"). In the event that the use of any such project by the Company in any way affects such Benefits, and upon written request from the Customer, Company will release said Customer's Energy Project(s) to the extent necessary for Customer to meet the prerequisites for such Benefits. Customer acknowledges that such release (i) may affect Customer's cash rebate discussed in Article 3 below; and (ii) will not affect any of Customer's other requirements or obligations.
 - c. Any future Customer Energy Project(s) committed by Customer shall be subject to a separate application and, upon approval by the Commission, said projects shall become part of this Agreement.
 - d. Customer will provide Company or Company's agent(s) with reasonable assistance in the preparation of the Commission's standard joint application for approval of this Agreement ("Joint Application") that will be filed with the Commission, with such Joint Application being consistent with then current Commission requirements.
 - e. Upon written request and reasonable advance notice, Customer will grant employees or authorized agents of either the Company or the Commission reasonable, pre-arranged access to the Customer Energy Project(s) for purposes of measuring and verifying energy savings and/or peak demand reductions resulting from the Customer Energy Project(s). It is expressly agreed that consultants of either the Company or the Commission are their respective authorized agents.
2. **Joint Application to the Commission.** The Parties will submit the Joint Application using the Commission's standard "Application to Commit Energy Efficiency/Peak Demand Reduction Programs" ("Joint Application") in which they will seek the Commission's approval of (i) this Agreement; (ii) the commitment of the Customer Energy Project(s) for inclusion in the Company Plan; and (iii) the Customer's Cash Rebate.

The Joint Application shall include all information as set forth in the Commission's standard form which, includes without limitation:

- i. A narrative description of the Customer Energy Project(s), including but not limited to, make, model and year of any installed and/or replaced equipment;
- ii. A copy of this Agreement; and
- iii. A description of all methodologies, protocols, and practices used or proposed to be used in measuring and verifying program results.

3. **Customer Cash Rebate.** Upon Commission approval of the Joint Application, Customer shall provide Company with a W-9 tax form, which shall at a minimum include Customer's tax identification number. Within the greater of 90 days of the Commission's approval of the Joint Application or the completion of the Customer Energy Project, the Company will issue to the Customer the Cash Rebate in the amount set forth in the Commission's Finding and Order approving the Joint Application.
- a. Customer acknowledges: i) that the Company will cap the Cash Rebate at the lesser of 50% of Customer Energy Project(s) costs or \$250,000; ii) the maximum rebate that the Customer may receive per year is \$500,000 per Taxpayer Identification Number per utility service territory; and iii) if the Customer Energy Project qualifies for a rebate program approved by the Commission and offered by the Company, Customer may still elect to file such project under the Company's mercantile customer self-direct program, however the Cash Rebate that will be paid shall be discounted by 25%; and
 - b. Customer acknowledges that breaches of this Agreement, include, but are not limited to:
 - i. Customer's failure to comply with the terms and conditions set forth in the Agreement, or its equivalent, within a reasonable period of time after receipt of written notice of such non-compliance;
 - ii. Customer knowingly falsifying any documents provided to the Company or the Commission in connection with this Agreement or the Joint Application.
 - c. In the event of a breach of this Agreement by the Customer, Customer agrees and acknowledges that it will repay to the Company, within 90 days of receipt of written notice of said breach, the full amount of the Cash Rebate paid under this Agreement. This remedy is in addition to any and all other remedies available to the Company by law or equity.
4. **Termination of Agreement.** This Agreement shall automatically terminate:
- a. If the Commission fails to approve the Joint Agreement;
 - b. Upon order of the Commission; or
 - c. At the end of the life of the last Customer Energy Project subject to this Agreement.

Customer shall also have an option to terminate this Agreement should the Commission not approve the Customer's Cash Rebate, provided that Customer provides the Company with written notice of such termination within ten days of either the Commission issuing a final appealable order or the Ohio Supreme Court issuing its opinion should the matter be appealed.

5. **Confidentiality.** Each Party shall hold in confidence and not release or disclose to any person any document or information furnished by the other Party in connection with this Agreement that is designated as confidential and proprietary ("Confidential Information"), unless: (i) compelled to disclose such document or information by judicial, regulatory or administrative process or other provisions of law; (ii) such document or information is generally available to the public; or (iii) such document or information was available to the receiving Party on a non-confidential basis at the time of disclosure.
- a. Notwithstanding the above, a Party may disclose to its employees, directors, attorneys, consultants and agents all documents and information furnished by the other Party in connection with this Agreement, provided that such employees, directors, attorneys,

consultants and agents have been advised of the confidential nature of this information and through such disclosure are deemed to be bound by the terms set forth herein.

- b. A Party receiving such Confidential Information shall protect it with the same standard of care as its own confidential or proprietary information.
 - c. A Party receiving notice or otherwise concluding that Confidential Information furnished by the other Party in connection with this Agreement is being sought under any provision of law, to the extent it is permitted to do so under any applicable law, shall endeavor to: (i) promptly notify the other Party; and (ii) use reasonable efforts in cooperation with the other Party to seek confidential treatment of such Confidential Information, including without limitation, the filing of such information under a valid protective order.
 - d. By executing this Agreement, Customer hereby acknowledges and agrees that Company may disclose to the Commission or its Staff any and all Customer information, including Confidential Information, related to a Customer Energy Project, provided that Company uses reasonable efforts to seek confidential treatment of the same.
6. **Taxes.** Customer shall be responsible for all tax consequences (if any) arising from the payment of the Cash Rebate.
7. **Notices.** Unless otherwise stated herein, all notices, demands or requests required or permitted under this Agreement must be in writing and must be delivered or sent by overnight express mail, courier service, electronic mail or facsimile transmission addressed as follows:

If to the Company:

FirstEnergy Service Company
76 South Main Street
Akron, OH 44308
Attn: Victoria Nofziger
Telephone: 330-384-4684
Fax: 330-761-4281
Email: vnofziger@firstenergycorp.com

If to the Customer:

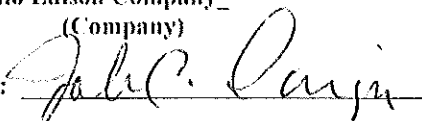
Clark State Community College
570 East Leffel Lane
Springfield, OH 45501
Attn: Joe Jackson - VP For Business Affairs
Telephone: 937.328.6003
Fax: 937.328.6142
Email: jacksonj@clarkstate.edu

or to such other person at such other address as a Party may designate by like notice to the other Party. Notice received after the close of the business day will be deemed received on the next business day; provided that notice by facsimile transmission will be deemed to have been received by the recipient if the recipient confirms receipt telephonically or in writing.

8. **Authority to Act.** The Parties represent and warrant that they are represented by counsel in connection with this Agreement, have been fully advised in connection with the execution thereof, have taken all legal and corporate steps necessary to enter into this Agreement, and that the undersigned has the authority to enter into this Agreement, to bind the Parties to all provisions herein and to take the actions required to be performed in fulfillment of the undertakings contained herein.
9. **Non-Waiver.** The delay or failure of either party to assert or enforce in any instance strict performance of any of the terms of this Agreement or to exercise any rights hereunder conferred, shall not be construed as a waiver or relinquishment to any extent of its rights to assert or rely upon such terms or rights at any later time or on any future occasion.
10. **Entire Agreement.** This Agreement, along with related exhibits, and the Company's Rider DSE, or its equivalent, as amended from time to time by the Commission, contains the Parties' entire understanding with respect to the matters addressed herein and there are no verbal or collateral representations, undertakings, or agreements not expressly set forth herein. No change in, addition to, or waiver of the terms of this Agreement shall be binding upon any of the Parties unless the same is set forth in writing and signed by an authorized representative of each of the Parties. In the event of any conflict between Rider DSE or its equivalent and this document, the latter shall prevail.
11. **Assignment.** Customer may not assign any of its rights or obligations under this Agreement without obtaining the prior written consent of the Company, which consent will not be unreasonably withheld. No assignment of this Agreement will relieve the assigning Party of any of its obligations under this Agreement until such obligations have been assumed by the assignee and all necessary consents have been obtained.
12. **Severability.** If any portion of this Agreement is held invalid, the Parties agree that such invalidity shall not affect the validity of the remaining portions of this Agreement, and the Parties further agree to substitute for the invalid portion a valid provision that most closely approximates the economic effect and intent of the invalid provision.
13. **Governing Law.** This Agreement shall be governed by the laws and regulations of the State of Ohio, without regard to its conflict of law provisions.
14. **Execution and Counterparts.** This Agreement may be executed in multiple counterparts, which taken together shall constitute an original without the necessity of all parties signing the same page or the same documents, and may be executed by signatures to electronically or telephonically transmitted counterparts in lieu of original printed or photocopied documents. Signatures transmitted by facsimile shall be considered original signatures.

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed by their duly authorized officers or representatives as of the day and year set forth below.

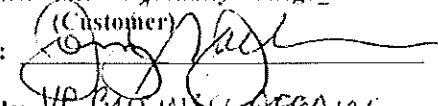
Ohio Edison Company_
(Company)

By: 

Title: V.P. Of Energy Efficiency

Date: 5-28-13

Clark State Community College_
(Customer)

By: 

Title: VP BUSINESS AFFAIRS

Date: 5-21-13

Affidavit of Clark State Community College Exhibit A

STATE OF OHIO)
) SS:
COUNTY OF Clark)

1. Joe Jackson, being first duly sworn in accordance with law, deposes and states as follows:
 1. I am the Vice President for Business Affairs/Treasurer of Clark State Community College ("Customer"). As part of my duties, I oversee energy related matters for the Customer.
 2. The Customer has agreed to commit certain energy efficiency projects to Ohio Edison Company ("Company"), which are the subject of the agreement to which this affidavit is attached ("Project(s)").
 3. In exchange for making such a commitment, the Company has agreed to provide Customer with Cash ("Incentive"). This Incentive was a critical factor in the Customer's decision to go forward with the Project(s) and to commit the Project(s) to the Company.
 4. All information related to said Project(s) that has been submitted to the Company is true and accurate to the best of my knowledge.

FURTHER AFFIANT SAYETH NAUGHT.



Sworn to before me and subscribed in my presence this 21 day of May, 2013.



David R. Farrell
Notary
David R. Farrell

This foregoing document was electronically filed with the Public Utilities

Commission of Ohio Docketing Information System on

10/8/2013 12:59:14 PM

in

Case No(s). 13-0901-EL-EEC

Summary: Application to Commit Energy Efficiency/Peak Demand Reduction Programs of Ohio Edison Company and Clark State Community College electronically filed by Ms. Jennifer M. Sybyl on behalf of Ohio Edison Company and Clark State Community College