University of South Carolina
Purchasing Department
1600 Hampton Street, 6th floor
Columbia, SC 29208
Telephone: (803) 777-4115

Request for Quotation

Page One

THIS IS NOT AN ORDER

Quotation must be received **No Later Than**: **11:00 AM**	Send quotation to above address Attention of:	Quotation Number:	Date
7 / 08 / 2013	Lana Widener	USC-RFQ-2471-LW	6 / 24 / 2013

Print company name and address:

e-mail address:

Please quote your lowest delivered price of the items(s) listed below. The Purchasing Department reserves the right to reject any or all quotes and to waive any or all technicalities.

1. If an item cannot be furnished, indicate by **NO QUOTE**.
2. All quotes must be signed by the vendor's representative and terms noted, failure to comply with this instruction may result in disqualification of the quote.
3. **FAXED QUOTES ACCEPTABLE.** FAX # (803) 777-2032

Federal I.D. or Social Security No. _____ SC Minority Certification Number (If Applicable)_____

Submitted By (Print Name)_____ Signature_____ Telephonee_____

Item No.	Quantity and Unit	Description of Commodity or Services	Unit Price	Total Price
1	LOT	Furnish and deliver mechanical equipment for USC Equestrian Farm Contact Info: Lana Widener, email: llw@sc.edu (803) 777-7776 (office) / (803) 777-2032 (fax) A faxed or e-mailed quote is acceptable. Bid/quote only as Specified. (SPM210) Deliveries shall be FOB Destination, freight prepaid (SPM055) Award will be made to one vendor for the entire quantity. (SPM034)		see bid schedule

GENERAL CONDITIONS

DEFAULT: In case or default by the Contractor, the University of South Carolina reserves the right to purchase any or all items in default in the open market, charging the Contractor with any additional costs. The defaulting Contractor shall not be considered a responsible bidder until the assessed charge has been satisfied.

All amendments to and interpretation of this RFQ shall be in writing. The procurement officer shall not be legally bound by any amendment or interpretation that is not in writing.

SC/US PREFERENCE: In order to receive the South Carolina/United States made, manufactured or grown end-product preference, you must check the appropriate space (s) provided on the face of the quotation form. This preference does not apply to services.

Any contract entered into by the University of South Carolina or its agencies resulting from this quotation shall be subject to cancellation at the end of any fiscal or appropriated year unless otherwise provided by law.

Payment will be made in accordance with Section 11-35-45 of the South Carolina Consolidated Procurement Code and Disbursement Regulations. Delay in receiving invoices, as well as errors and omissions on the invoices, will be considered just cause for withholding payment without losing discount privileges. The University reserves the right to withhold payment or make such deductions as may be necessary to protect the University from loss or damage because of defective work, claims, damages or to pay for repair of correction of materials furnished hereunder.

Quoted prices must remain firm for a period of thirty days beyond the Request for Quotation deadline. Unit prices will govern over extended prices unless otherwise stated.

The University of South Carolina shall consider payment discounts in the award of this contract when such discounts are for thirty days or more after final inspection and acceptance of contract requirements. Payment discounts for less than thirty days are encouraged but shall not be a factor in award determination. Please state your discount terms using the above referenced information as the University's position on the matter.

All materials and products offered must be guaranteed to meet and comply with the requirements all the specifications, terms and conditions indicated or referred to.

The award will be made in accordance with Section 11-35-1520 of the South Carolina Consolidated Procurement Code.

The University reserves the right to reject any and all quotations and to cancel the solicitation; waive any and all technicalities; the University reserves the right to reject any quotation in which the delivery tine indicated to be of substantial length to cause disruption and/or delay in operation for which the item(s) is/are intended; ambiguous quotations which are uncertain as to terms, delivery, quantity or compliance with specifications may be rejected.

The successful contractor assumes sole responsibility and shall hold harmless the University of South Carolina, its directors, officers, employees and agents from and against any and all claims, actions or liabilities of any nature which may be asserted against them by third parties in connection with the performance of the successful bidder, its directors, officers, employees and agents under this agreement. The University of South Carolina agrees to accept responsibility for claims, actions or liabilities resulting from negligent acts of its employees occurring within the scope of their employment which may be asserted against them by third parties in connection with the performance of the University of South Carolina, its members, directors, officers, employees and agents under this agreement.

Contractor agrees not to refer to award of this contract in commercial advertising in such a manner to state or imply that the products or service provided are endorsed or preferred by the user.

Upon award of a contract under this quotation, the person, partnership, association or corporation to whom the award is made must comply with the laws of South Carolina that require such person or entity to be authorized and/or licensed to do business in this State. Notwithstanding the fact that applicable statutes may be exempt or exclude the successful quoter from requirements that it be authorized and/or licensed to do business in this State, by submission of this singed quote, the quoter agrees to subject itself to the jurisdiction and process of the courts of the State of South Carolina as to all matters and disputes arising or to arise under the contract and the performance thereof, including any questions as to the liability for taxes, licenses or fees levied by the State.

Termination: Subject to the provisions below, the contractor may be terminated for any reason by the University providing a thirty-day advance notice in writing is given to the contractor.

Termination for Convenience: In the event that this contract is terminated or cancelled upon request and for the convenience of the University may negotiate reasonable termination costs, if applicable.
Termination for Cause: Termination by the University for cause, default, or negligence on the part of the Contractor shall be excluded from the foregoing provisions; termination costs, if any, shall not apply. The thirty day advance notice requirement is waived and the default provision in this bid shall apply.

HIPAA Law: The Contractor agrees that to the extent that some or all of the activities within the scope of this Contract are subject to the Health Insurance Portability Accountability Act of 1996, P.L. 104-91, as amended ("HIPAA"), or its implementing regulations, it will comply with the HIPAA requirements and will execute such agreements and practices as the University of South Carolina may require to ensure compliance. Additional information may be viewed at: http://www.sc.edu/hipaa/

SPECIAL CONDITIONS

LICENSES, PERMITS, INSURANCE: All costs for required licenses, permits and insurance shall be borne by the Bidder.

The University of South Carolina requires all contractual activities to be performed in a manner that is consistent with all applicable federal, state and local laws, regulations, rules, rulings and ordinances. These include, but are not limited to: the Occupational safety and Health Act, The Environmental Protection Act, The South Carolina Hazardous Waste Management Act.

IMPORTANT – Please Note
Vendors, we MUST have your Federal ID # (company) or Social Security # (individual) before processing any invoices for payment. Failure to provide this information will result in delay of payments until this information is received. Please include this information with your quote.

ADDITIONAL CONDITIONS

PREFERENCES - A NOTICE TO VENDORS (SEP. 2009): On June 16, 2009, the South Carolina General Assembly rewrote the law governing preferences available to in-state vendors, vendors using in-state subcontractors, and vendors selling in-state or US end products. This law appears in Section 11-35-1524 of the South Carolina Code of Laws. A summary of the new preferences is available at www.procurement.sc.gov/preferences. ***ALL THE PREFERENCES MUST BE CLAIMED AND ARE APPLIED BY LINE ITEM, REGARDLESS OF WHETHER AWARD IS MADE BY ITEM OR LOT.*** **VENDORS ARE CAUTIONED TO CAREFULLY REVIEW THE STATUTE BEFORE CLAIMING ANY PREFERENCES. THE REQUIREMENTS TO QUALIFY HAVE CHANGED. IF YOU REQUEST A PREFERENCE, YOU ARE CERTIFYING THAT YOUR OFFER QUALIFIES FOR THE PREFERENCE YOU'VE CLAIMED. IMPROPERLY REQUESTING A PREFERENCE CAN HAVE SERIOUS CONSEQUENCES.** [11-35-1524(E)(4)&(6)]

PREFERENCES - SC/US END-PRODUCT (SEP 2009): Section 11-35-1524 provides a preference to vendors offering South Carolina end-products or US end-products, if those products are made, manufactured, or grown in SC or the US, respectively. An end-product is the tangible project identified for acquisition in this solicitation, including all component parts in final form and ready for the use intended. The terms "made," "manufactured," and "grown" are defined by Section 11-35-1524(A). By signing your offer and checking the appropriate space(s) provided and identified on the bid schedule, you certify that the end-product(s) is either made, manufactured or grown in South Carolina, or other states of the United States, as applicable. Preference will be applied as required by law. Post award substitutions are prohibited. See "Substitutions Prohibited - End Product Preferences (Sep 2009)" provision.

PREFERENCES - RESIDENT VENDOR PREFERENCE (SEP 2009): To qualify for the RVP, you must maintain an office in this state. An office is a nonmobile place for the regular transaction of business or performance of a particular service which has been operated as such by the bidder for at least one year before the bid opening and during that year the place has been staffed for at least fifty weeks by at least two employees for at least thirty five hours a week each. In addition, you must either: (1) maintain at a location in South Carolina at the time of the bid an inventory of expendable items which are representative of the general type of commodities for which the award will be made and which have a minimum total value, based on the bid price, equal to the lesser of fifty thousand dollars [$50,000] or the annual amount of the contract; or (2) be a manufacturer headquartered and having an annual payroll of at least one million dollars in South Carolina and the end product being sold is either made or processed from raw materials into a finished end product by that manufacturer or its affiliate (as defined in Section 1563 of the Internal Revenue Code).

SUBSTITUTIONS PROHIBITED - END PRODUCT PREFERENCES (SEP 2009): If you receive the award as a result of the South Carolina end product or United States end product preference, you may not substitute a nonqualifying end product for a qualified end product. If you violate this provision, the State may terminate your contract for cause and you may be debarred. In addition, you shall pay to the State an amount equal to twice the difference between the price paid by the State and your evaluated price for the item for which you delivered a substitute. [11-35-1534(B)(4)]

MINORITY PARTICIPATION (JAN 2006)

Is the bidder a South Carolina Certified Minority Business? □ Yes □ NO

Is the bidder a Minority Business certified by another governmental entity? □ Yes □ NO

If so, please list the certifying governmental entity: _____

Will any of the work under this contract be performed by a SC certified Minority Business as a subcontractor? □ Yes □ NO

If so, what percentage of the total value of the contract will be performed by a SC certified Minority Business as a subcontractor? □ Yes □ NO

Will any of the work under this contract be performed by a minority business certified by another governmental entity as a subcontractor? □ Yes □ NO

If so, what percentage of the total value of the contract will be performed by a minority business certified by another governmental entity as a subcontractor? □ Yes □ NO

If a certified Minority Business is participating in this contract, please indicate all categories for which the Business is certified:

□ Traditional minority

□ Traditional minority, but female

□ Women (Caucasian females)

□ Hispanic minorities

□ DOT referral (Traditional minority)

□ DOT referral (Caucasian female)

□ Temporary certification

□ SBA 8 (a) certification referral

□ Other minorities (Native American, Asian, etc.)

(If more than one minority contractor will be utilized in the performance of this contract, please provide the information above for each minority business.)

Scope of Work:

It is the intent of the University of South Carolina to solicit bids from qualified vendors to furnish and deliver mechanical equipment for the One Wood Equestrian Farm (1201 Syrup Mill Road, Blythewood, SC 29016) in accordance with all requirements stated herein.

Submit Questions or Requests to:

Lana Widener, Procurement Officer
e-mail: llw@sc.edu
fax: 803-777-2032

Deadline for Questions or Requests for Approval for Substitutions:

Monday, July 1, 10:00 AM

Specifications

See Bid Schedule for list of products.

The specifications listed herein are not to be considered restrictive to one source of supply. However, items offered must be equal in quality and performance. The offeror must include with his bid/quote, supporting product data sufficient for the University to determine equality and acceptability. The right is reserved to reject any offering in which the items offered are considered unsatisfactory in any manner. The University will determine if minor deviations from the listed features are acceptable. (SPM022)

Requests for substitutions received after the deadline date and time stated above will not be considered for this solicitation.

Note: An amendment will be issued for any approved substitutions.

BID SCHEDULE

ITEMS 1-5
COMMODITY (MATERIALS)

Item	Qty	Unit of Measure	Description	Unit Price
1	**1**	**Each**	**Packaged Air Conditioning Unit, Tag AHU-1 Aaon Model #RQ-005-1-H-EB09-12A, or approved equal.**	**$_____**

Manufacture_____ Part No._____

Resident Vendor Preference _____
SC End Product Preference _____
US End Product Preference _____

Item	Qty	Unit of Measure	Description	Unit Price
2	**1**	**Each**	**Ductless Split System, Tag AHU-2 / HP-2 Mitsbushi model #SEZ-KD09NA4 with condensing unit #SUZ-KA09NA, or approved equal. Include disconnect and filter box.**	**$_____**

Manufacture_____ Part No._____

Resident Vendor Preference _____
SC End Product Preference _____
US End Product Preference _____

Item	Qty	Unit of Measure	Description	Unit Price
3	**1**	**Each**	**Exhaust Fan, Tag EF-1 Cook 100SQN15D, or approved equal.**	**$_____**

Manufacture_____ Part No._____

Resident Vendor Preference _____
SC End Product Preference _____
US End Product Preference _____

Item	Qty	Unit of Measure	Description	Unit Price
4	**2**	**Each**	**Air Curtains, Tag AC-1, AC-2 Mars LPN36, Mars LPN72, or approved equal.**	**$_____**

Manufacture_____ Part No._____

Resident Vendor Preference _____
SC End Product Preference _____
US End Product Preference _____

Note: **The commodity preferences do not apply to a single unit of an item with a price in excess of $50,000 or a single award with a total potential value in excess of $500,000. [11-35-1524(E)(2)]**

Item	Qty	Unit of Measure	Description	Extended Price
5	1	Job	Freight	$_____

Grand Total for Items 1-5 $_____
(Do not include sales tax; this will be calculated accordingly.)

Estimated Delivery Date: _____

AHU-1

UNIVERSITY OF SOUTH CAROLINA
ONE WOOD FARM EQUESTRIAN -
LOCKER ROOM PROJECT
BLYTHEWOOD, SC

STATE PROJECT H27-Z004
A/E PROJECT #11040.02

SECTION 15735 - PACKAGED AIR CONDITIONING UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Packaged unit.

B. Unit controls.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

A. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilation Systems; National Fire Protection Association.

B. ANSI/AHRI Standard 340/360 performance rating of commercial and industrial unitary air-conditioning and heat pump equipment.

C. UL Standard 1995/CSA C22.2 No. 236, Safety Standard for Heating and Cooling Equipment.

D. ASHRAE 15, Safety Standard for Mechanical Refrigeration.

E. ASHRAE 90.1, Energy Efficient Design of New Buildings except Low-Rise Residential Buildings.

1.04 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements, and duct connections.

C. Shop Drawings: Indicate capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements, and duct connections.

D. Manufacturer's Instructions: Indicate assembly, support details, connection requirements, and include start-up instructions.

E. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listing.

F. Warranty: Submit manufacturer's warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01600 - Product Requirements, for additional provisions.
   2. Extra Filters: One set for each unit.

H. Operation and Maintenance Manuals: Include in manuals the information listed below. For information on how to prepare and submit manuals see section 1780 (Closeout Submittals).
   1. Recommended spare parts
   2. Spare parts lists
   3. Operating instructions
   4. Maintenance instructions, including preventative and corrective maintenance.

5. Copies of warranties
6. Wiring diagrams
7. Shop drawings and product data

1.05 WARRANTY

A. See Section 01780 - Closeout Submittals, for additional warranty requirements.

B. Provide a three year warranty from the equipment startup to include parts, refrigerant, and labor. Warranty shall cover material and workmanship that prove defective, within the specified warranty period, provided manufacturer's written instructions for installation, operation and maintenance have been followed. Warranty excludes parts associated with routine maintenance, such as belts and air filters.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Aaon.

B. Substitutions: See Section 01600 - Product Requirements.

2.02 AIR CONDITIONING UNITS

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

B. Construction
   1. All cabinet walls, access doors, and roof shall be fabricated of double wall, impact resistant, rigid polyurethane foam panels.
   2. Unit insulation shall have a minimum thermal resistance R-value of 13. Foam insulation shall have a minimum density of 2 pounds/cubic foot and shall be tested in accordance with ASTM D-1929 for a minimum flash ignition temperature of 610°F.
   3. Unit construction shall be double wall with G90 galvanized steel on both sides and a thermal break. Double wall construction with a thermal break prevents moisture accumulation on the insulation, provides a cleanable interior, prevents heat transfer through the panel, and prevents exterior condensation on the panel.
   4. Unit shall be designed to reduce air leakage and infiltration through the cabinet. Cabinet leakage shall not exceed 1% of total airflow when tested at 3 times the minimum external

static pressure provided in AHRI Standard 210/240. Panel deflection shall not exceed L/240 ratio at 125% of design static pressure, at a maximum 8 inches of positive or negative static pressure, to reduce air leakage. Deflection shall be measured at the midpoint of the panel height and width. Continuous sealing shall be included between panels and between access doors and openings to reduce air leakage. Piping and electrical conduit through cabinet panels shall include sealing to reduce air leakage.

5. Roof of the air tunnel shall be sloped to provide complete drainage. Cabinet shall have rain break overhangs above access doors.
6. Access to filters, dampers, cooling coil, reheat coil, heater, compressor, and electrical and controls components shall be through hinged access doors with quarter turn, lockable handles. Full length stainless steel piano hinges shall be included on the doors.
7. Exterior paint finish shall be capable of withstanding at least 2,500 hours, with no visible corrosive effects, when tested in a salt spray and fog atmosphere in accordance with ASTM B 117-95 test procedure.
8. Units shall include double sloped 304 stainless steel drain pans.
9. Unit shall be provided with left side horizontal discharge and return air openings. All openings through the unit shall have upturned flanges of at least 1/2 inch around the opening.
10. Unit shall include lifting lugs on the top of the unit.

C. Electrical
   1. Unit shall be provided with factory installed and factory wired, non-fused disconnect switch.
   2. Unit shall be provided with phase and brown out protection which shuts down all motors in the unit if the electrical phases are more than 10% out of balance on voltage, the voltage is more than 10% under design voltage or on phase reversal.

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

E. Cooling Coils
   1. Evaporator Coils
      a. Coils shall be designed for use with R-410A refrigerant and constructed of copper tubes with aluminum fins mechanically bonded to the tubes and aluminum end casings. Fin design shall be sine wave rippled.
      b. Coil shall be 6 row high capacity
      c. Coils shall be helium leak tested.
      d. Coils shall be furnished with factory installed thermostatic expansion valves.

F. Refrigeration System
   1. Unit shall be factory charged with R-410A refrigerant.
   2. Compressors shall be scroll type with thermal overload protection and carry a 5 year non-prorated warranty, from the date of original equipment shipment from the factory.
   3. Compressors shall be mounted in an isolated service compartment which can be accessed without affecting unit operation. Lockable hinged compressor access doors shall be fabricated of double wall, rigid polyurethane foam injected panels to prevent the

transmission of noise outside the cabinet.

4. Compressors shall be isolated from the base pan with the compressor manufacturer's recommended rubber vibration isolators, to reduce any transmission of noise from the compressors into the building area.
5. Each refrigeration circuit shall be equipped with thermostatic expansion valve type refrigerant flow control.
6. Each refrigeration circuit shall be equipped with automatic reset low pressure and manual reset high pressure refrigerant safety controls, Schrader type service fittings on both the high pressure and low pressure sides and a factory installed replaceable core liquid line filter driers.
7. Unit shall include a variable capacity scroll compressor on the refrigeration circuit which shall be capable of modulation from 10-100% of its capacity.
8. Refrigeration circuit shall be provided with hot gas reheat coil, modulating valves, electronic controller, supply air temperature sensor and a control signal terminal which allow the unit to have a dehumidification mode of operation, which includes supply air temperature control to prevent supply air temperature swings and overcooling of the space.
9. Refrigeration circuit shall include adjustable compressor lockouts.

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

H. Electric Heating
   1. Unit shall include an electric heater consisting of electric heating coils, fuses and a high temperature limit switch, with capacities as shown on the plans.
   2. Electric heating coils shall be located in the reheat position downstream of the cooling coil.
   3. Electric heater shall have full modulation capacity controlled by an SCR (Silicon Controlled Rectifier). A 0-10 VDC heating control signal shall be field provided to control the amount of heating.

I. Filters
   1. Unit shall include 2 inch thick, pleated panel filters with an ASHRAE efficiency of 30% and MERV rating of 8, upstream of the cooling coil.

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

K. Controls
1. Factory Installed and Factory Provided Controller
a. Unit controller shall be capable of controlling all features and options of the unit. Controller shall be factory installed in the unit controls compartment and factory tested.
b. Controller shall be capable of stand alone operation with unit configuration, setpoint adjustment, sensor status viewing, unit alarm viewing, and occupancy scheduling available without dependence on a building management system.
c. Controller shall have an onboard clock and calendar functions that allow for occupancy scheduling.
d. Controller shall include non-volatile memory to retain all programmed values without the use of a battery, in the event of a power failure.
e. Constant Volume Controller
1) Unit shall modulate cooling with constant airflow to meet space temperature cooling loads.
2) With modulating hot gas reheat, unit shall modulate cooling and hot gas reheat as efficiently as possible, to meet space humidity loads and prevent supply air temperature swings and overcooling of the space.
3) Unit shall modulate heating with constant airflow to meet space temperature heating loads. Modulating heating capacity shall modulate based on supply air temperature.
f. Unit configuration, setpoint adjustment, sensor status viewing, unit alarm viewing, and occupancy scheduling shall be accomplished with connection to interface module with LCD screen and input keypad, interface module with touch screen, or with connection to PC with free configuration software. Controller shall be capable of connection with other factory installed and factory provided unit controllers with individual unit configuration, setpoint adjustment, sensor status viewing, and occupancy scheduling available from a single unit. Connection between unit controllers shall be with a modular cable. Controller shall be capable of communicating and integrating with a LonWorks or BACnet network.
g. Building Static Pressure Sensor will modulate outdoor air damper to provide a slight positive pressure in the space when the exhaust fan turns on.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that roof is ready to receive work and opening dimensions are as indicated on shop drawings.

B. Verify that proper power supply is available.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in accordance with NFPA 90A.

3.03 SYSTEM STARTUP

A. Prepare and start equipment. Adjust for proper operation.

3.04 CLOSEOUT ACTIVITIES

A. Demonstrate operation to Owner's maintenance personnel.

END OF SECTION

SECTION 15940 - HVAC SEQUENCE OF OPERATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section defines the manner and method by which controls function. Requirements for each type of control system operation are specified. Equipment, devices, and system components required for control systems are specified in other sections.

B. Sequence of operation for:
   1. Packaged Roof Top Unit
   2. Exhaust Fan

1.02 RELATED SECTIONS

A. Section 16155 - Equipment Wiring: Electrical characteristics and wiring connections.

1.03 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Sequence of Operation Documentation: Submit written sequence of operation for entire HVAC system and each piece of equipment.

C. Control System Diagrams: Submit graphic schematic of the control system showing each control component and each component controlled, monitored, or enabled.
   1. Label with settings, adjustable range of control and limits.
   2. Include flow diagrams for each control system, graphically depicting control logic.
   3. Include draft copies of graphic displays indicating mechanical system components, control system components, and controlled function status and value.

D. Project Record Documents: Record actual locations of components and setpoints of controls, including changes to sequences made after submission of shop drawings.

PART 3 EXECUTION

2.01 PACKAGED ROOF TOP UNIT

A. The packaged roof top unit shall be controlled by the factory installed controller.
   1. During occupied mode the building static pressure sensor shall sense the drop in pressure when the exhaust fan turns on and automatically adjust the outside air to maintain a positive pressure in the building. 1/4" sensing tubing shall be supplied and installed by the mechanical contracctor to the area with the greatest pressure drop.
   2. In unoccupied mode the outside air damper shall be closed and the unit will run as required to maintain unoccupied space temperatures and humidities.

2.02 EXHAUST FAN

A. The exhaust fan shall be controlled by an occupancy sensor. See electrical drawings and specifications for occupancy sensor requirements.

END OF SECTION

Unit Rating

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.192 (SN: 5408304-DTB0APNK)

1A	1B	1C	1D	2	3	4	5A	5B	5C	6A	6B	6C	7	8	9	10	11	12	13	14A	14B	15	16	17	18	19	20	21	22	23
R	Q	-	0	0	5	-	1	-	H	-	E	B	0	9	-	1	2	A	:	A	0	0	0	-	E	0	0	-	Q	K	C

1A	1B	1C	1D	2	3	4	5A	5B	5C	6A	6B	6C	7	8	9	10	11	12	13	14A	14B	15	16	17	18	19	20	21	22	23
-	0	A	0	-	N	D	D	B	0	B	E	-	0	0	-	0	0	0	0	0	0	0	A	X							

Tag: RTU# 4

(Values do not account for changes described in SPA)

Job Information

Job Name:	*Wood Farm Locker Room Selection*
Job Number:	*001232*
Site Altitude:	*226 ft*
Refrigerant	*R-410A*

Static Pressure

External:	*0.75 in. wg.*
Evaporator:	*0.21 in. wg.*
Filters Clean:	*0.03 in. wg.*
Dirt Allowance	*0.35 in. wg.*

Cooling Section

	Gross	Net
Total Capacity:	*63.76*	*62.23 MBH*
Sensible Capacity:	*41.33*	*39.80 MBH*
Latent Capacity:	*22.43 MBH*	
Mixed Air Temp:	*92.16 °F DB*	*73.30 °F WB*
Entering Air Temp:	*92.16 °F DB*	*73.30 °F WB*
Lv Air Temp (Coil):	*53.40 °F DB*	*53.20 °F WB*
Lv Air Temp (Unit)	*54.76 °F DB*	*53.76 °F WB*
Digital Comp. Capacity Ratio:	*100%*	
Supply Air Fan:	*1 x RQ185D60-VFD @ 0.47 BHP*	
SA Fan RPM / Width:	*1404 / 1.750"*	
Evaporator Coil:	*5.3 ft² / 6 Rows / 14 FPI*	
Evaporator Face Velocity:	*197.1 fpm*	

Unit Information

Approx. Op./Ship Weights:	*883 / 883 lbs.*
Supply CFM/ESP:	*1035 / 0.75 in. wg.*
Final-Filter FV / Qty:	*186.30 fpm / 2*
Outside CFM:	*800*
Ambient Temperature:	*96 °F DB / 75 °F WB*
Return Temperature:	*79.1 °F DB / 67 °F WB*
Economizer:	*0.00 in. wg.*
Heating:	*0.09 in. wg.*
Cabinet:	*0.02 in. wg.*
Total:	*1.47 in. wg.*

Heating Section

PreHeat Type:	*Std (No Preheat)*
Heating Type:	*Electric Heat*
Heating CFM:	*957*
Total Capacity:	*68.3 MBH*
OA Temp:	*21.0 DB / 16.0°F WB*
RA Temp:	*68.1 °F DB / 62.0 °F WB*
Entering Air Temp:	*28.7 °F DB / 26.1 °F WB*
Leaving Air Temp:	*95.3 °F DB / 58.6 °F WB*
Bypass CFM:	*0*
Input:	*20.0 kW*
Heater Qty (Hi/Low):	*2*
Electric Heat FLA:	*83.3*

Re-Heat Coil:

Capacity:	*18 MBH*
LA DB / WB:	*70.00 °F / 59.66 °F*
RH:	*55%*

Rating Information

Cooling Capacity (MBH):	*63.5*
Cooling SEER:	*14.8*
Cooling EER:	*12.7*
Rated in accordance with AHRI 210/240	
Application EER @ Op. Conditions:	*12.2*

Electrical Data

Rating:	*230/1/60*
Unit FLA:	*91*
Minimum Circuit Amp:	*113*
Maximum Overcurrent:	*125*

	Qty	HP	VAC	Phase	RPM	FLA	RLA
Compressor 1:	1		230	1			25.6
Condenser Fans:	1	0.333	230	1	1100	2.8	
Supply Fan:	1	1.00	230	3	1760	4.2	

*Cabinet Sound Power Levels**

Octave Bands:	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**
Discharge LW(dB):	78	78	80	73	68	66	62	56
Return LW(dB):	72	72	69	60	58	55	50	41

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

18.5" STAR Plenum

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.192 (SN: 5408304-DTB0APNK)

JOB INFORMATION:

Job Name:	*Wood Farm Locker Room*
Job Tag:	*Selection*
Rep Firm:	*RTU# 4*
Date:	
	11/27/2012
	11/27/2012

WHEEL SPECIFICATION:

Max RPM:	*2,200*
Diameter x Qty:	
CFM:	*18.5 in. x 1*
Tip Speed:	*1035*
Inertia:	*6,800 FPM*
	6,800 FPM

OPERATING CONDITIONS:

Air Flow:	*1,035 CFM*
Static Pressure:	*1.47 in. Wg.*
Relief Dampers DP:	*0.00 in. Wg.*
TSP:	*1.47 in. Wg.*
Site Altitude:	*226.00 Ft*
TSP @ Sea Level:	*1.48 in. Wg.*

MOTOR SELECTION:

Rated HP / Bypass:	*1 / No*
Frame Size:	*48*
Nominal RPM:	*1760*
VAC/PH/HZ:	*230/1/60*
Efficiency	*Standard / 0.785*
Enclosure Type:	*ODP*
Max Inertial Load:	*15 WR²*

FAN PERFORMANCE:

RPM:	*1404*
BHP:	*0.47*
Efficiency:	*50.9%*
In/Out Velocity:	*/ FPM*
Plenum Out Velocity:	*17 FPM*

Max Duct SP with Blocked Airway: 2.2 in. Wg. @ 1404 rpm

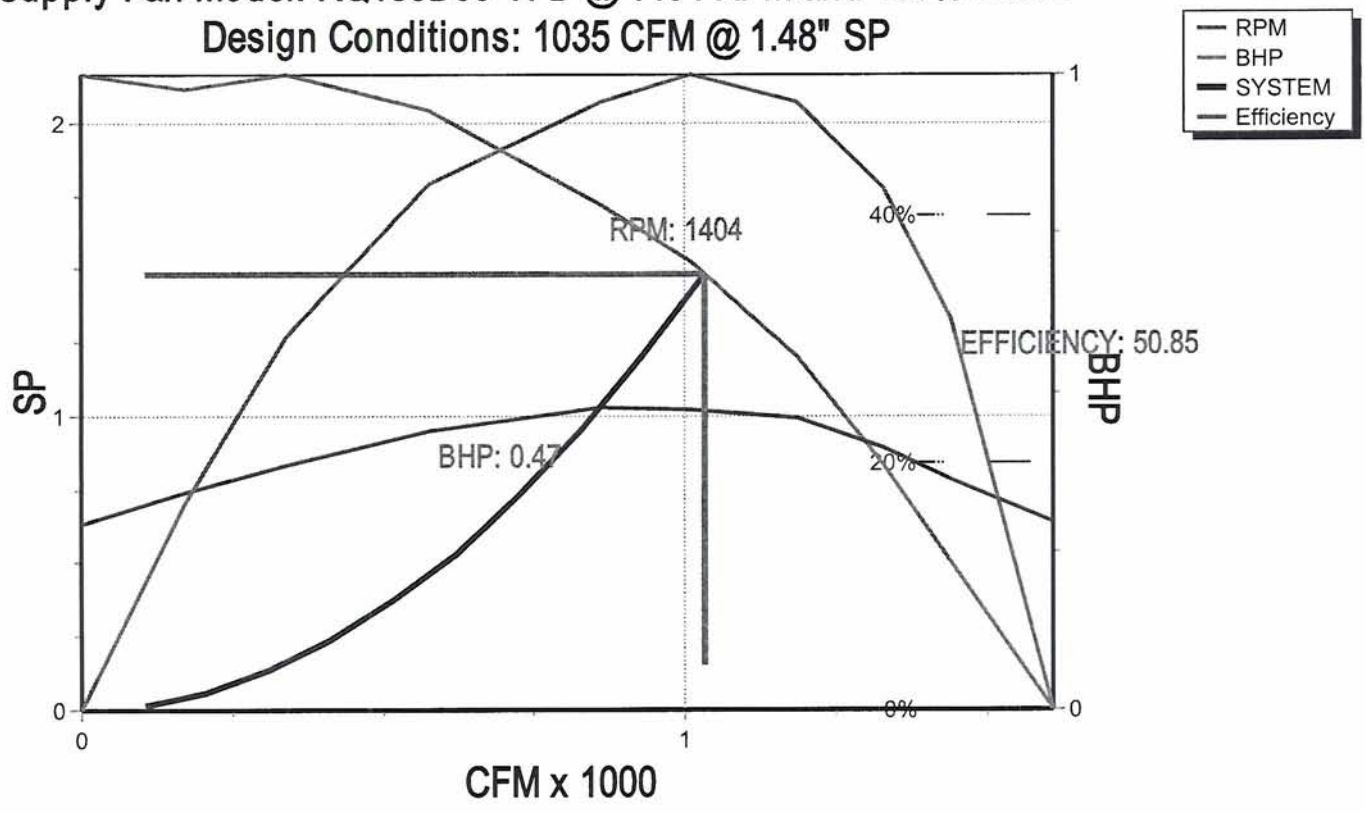
FAN SOUND POWER (Inlet/Outlet):

Octave Band: (Re 10^-12 watts)

1	2	3	4	5	6	7	8
78	*78*	*80*	*75*	*71*	*69*	*66*	*60*
78	*78*	*80*	*75*	*71*	*69*	*66*	*60*

SOUND POWER A-Weighted: 80 / 80 dB

Supply Fan Model: RQ185D60-VFD @ 1404 RPM and 100% Width
Design Conditions: 1035 CFM @ 1.48" SP



Unit Submittal

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.192 (SN: 5408304-DTB0APNK)

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

RQ-005-1-H-EB09-12A:A000-E00-QKC-0A0-NDDB0BE-00-0000000AX

Tag: RTU# 4

Job Name: *Wood Farm Locker Room Selection*
Job Number: *001232*
Unit Submittal For:
Unit Submittal Date: *November 27, 2012*

	Base Option	Description
R	Series	Roof Top Unit
Q	Generation	Tenth Generation
005	Unit Size	Five
1	Voltage	230V/1Ø/60Hz
H	Interior Protection	Horizontal Discharge and Return
E	Refrigerant Style	R-410A Variable Capacity Scroll Compressor (VCC) - High Efficiency
B	Unit Configuration	Air-Cooled Cond. + 6 Row Evap. Coil
0	Coil Coating	Standard
9	Cooling/Heat Pump Staging	Modulating - 1 Variable Capacity Compressor
1	Heating Type	Electric Heat
2	Heating Designation	Heat 2 - 20 kW
A	Heating Staging	Modulating/SCR Electric - 0-10V Control Signal

	Feature Option	Description
A	1A. RA/OA Section	Economizer
0	1B. RA/EA Blower Configuration	Standard - None
0	1C. RA/EA Blower	Standard - None
0	1D. RA/EA Blower Motor	Standard - None
E	2. OA Control	DDC Actuator
0	3. Heat Options	Standard
0	4. Maintenance Options	Standard
Q	5A. SA Blower Configuration	1 Blower + Inverter Rated 3 Phase Motor + VFD
K	5B. SA Blower	19" Direct Drive Backward Curved Plenum - 60% Width
C	5C. SA Motor	1 HP 1750 rpm
0	6A. Pre Filter Type	Standard - None
A	6B. Unit Filter Type	2" Pleated - 30% Eff
0	6C. Filter Options	Standard
N	7. Refrigeration Control	Fan Cycling + Adjustable CLO - Each Circuit
D	8. Refrigeration Options	Modulating Hot Gas Reheat
D	9. Refrigeration Accessories	ECM Condenser Fan - Multiple Speed
B	10. Power Options	Power Switch - 150 amps
0	11. Safety Options	Standard
B	12. Controls	Phase & Brown Out Protection
E	13. Special Controls	Constant Volume (CV) Unit Controller - CV Cool + CV Heat
0	14A. Preheat Configuration	Standard - None
0	14B. Preheat Sizing	Standard - None
0	15. Glycol Percent	Water or No WSHP
0	16. Interior Cabinet Options	Standard - Double Wall + R-13 Foam Insulation + Stainless Steel Drain Pan
0	17. Exterior Cabinet Options	Standard
0	18. Customer Code	Standard
0	19. Code Options	Standard - ETL U.S.A. Listing
0	20. Crating	Standard
0	21. Water-Cooled Cond.	Standard - None
A	22. Control Vendors	Wattmaster Controls
X	23. Type	Special Price Authorization + AAON Gray Paint

VCMX Components

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.192 (SN: 5408304-DTB0APNK)

1A	1B	1C	1D	2	3	4	5A	5B	5C	6A	6B	6C	7	8	9	10	11	12	13	14A	14B	15	16	17	18	19	20	21	22	23
R	Q	-	0	0	5	-	1	-	H	-	E	B	0	9	-	1	2	A	:	A	0	0	0	-	E	0	0	-	Q	K	C

-	0	A	0	-	N	D	D	B	0	B	E	-	0	0	-	0	0	0	0	0	0	0	A	X						

Tag: RTU# 4

Job Name: *Wood Farm Locker Room Selection*

VCMX For:

Job Number: *001232*

VCMX Date: *November 27, 2012*

Hardware Included For VCMX Controller

Part #	Included Parts	Assigned Channel
V07150	VCMX Controller with EBUS	
R28390	Suction Pressure Transducer	MainController\AI5
P94320	Space Temp Sensor - Field Installed	MainController\AI1
R82890	Supply Air Temp Sensor - Field Installed	MainController\AI2
R81550	Outside Air Temp Sensor	MainController\AI4
R69190	VCMX Large Expansion Module	
P62520	Proof of Flow Sensor	LargeExpansionModule\BI3
R34690	Space Humidity Sensor - Field Installed	LargeExpansionModule\AI2

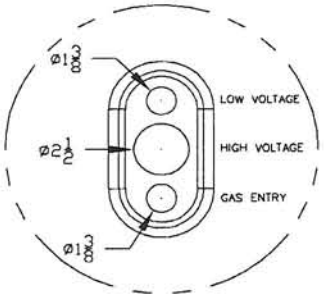
		1	2	3	4	5	6	7
VCMX Controller with EBUS	Analog In	X	X		X	X		
	Analog Out	X	X					
	Binary In							
	Relay Out	X	X	X				
	Digital Sensor(s)							

		1	2	3	4	5	6	7	8
VCMX Large Expansion Module	Analog In		X						
	Analog Out		X	X					
	Binary In			X					
	Relay Out								

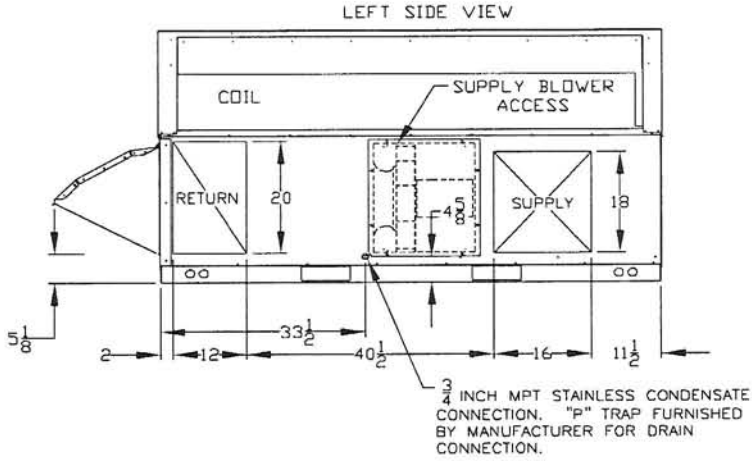
RQ CABINET
ECONOMIZER HORIZONTAL ~ 1–6 TON

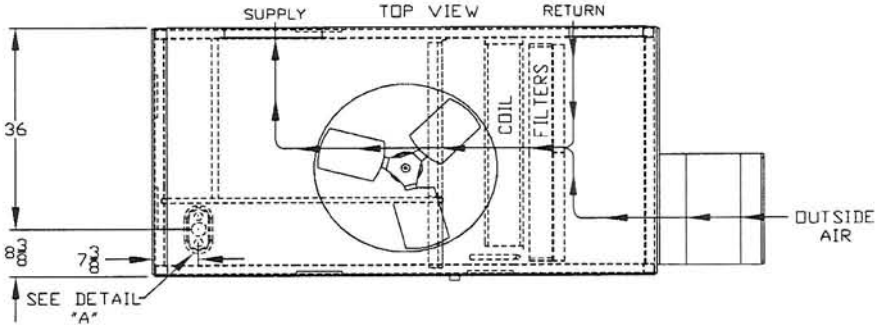
CLEARANCES

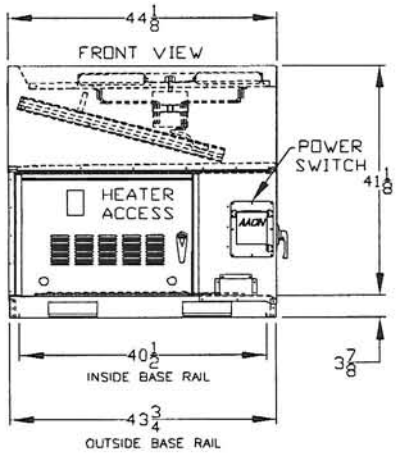
LOCATION	◦ UNIT SIZE ◦ 1 - 6 TON
OUTSIDE AIR (BACK)	36
HXC (FRONT)	36
LEFT SIDE	24
RIGHT SIDE	48
TOP	UNOBSTRUCTED

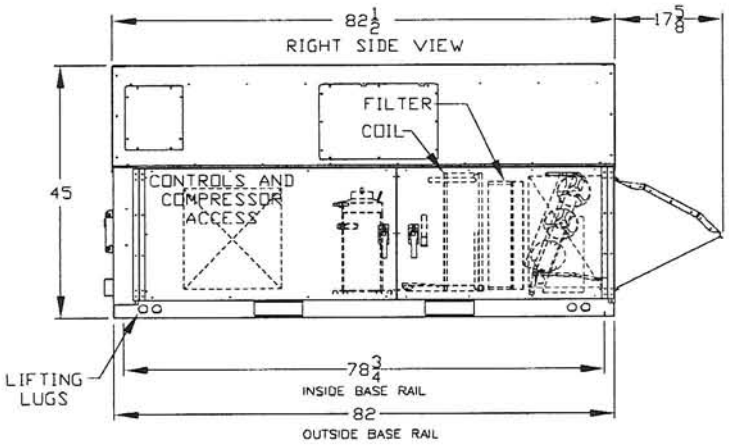


DETAIL A







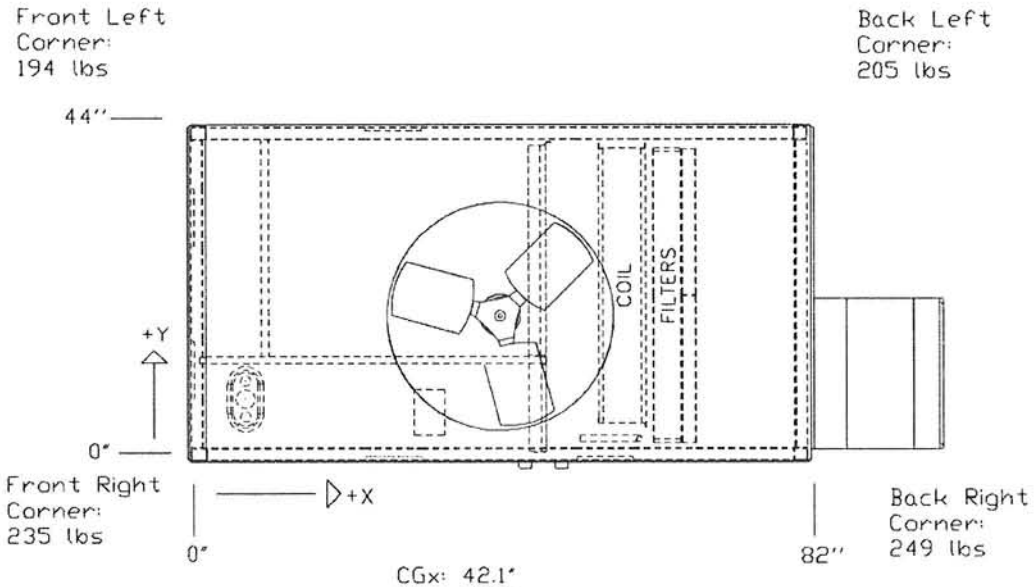


RQ–00011 REV:C 04/05/12 JRL
NOTE: ALL DIMENSIONS ARE IN INCHES

RQ CABINET
HORIZONTAL AIR COOLED CONDENSING UNIT

AAON®

RQ-005-1-H-EB09-12A:A000-E00-QKC-0A0-NDDB0BE-00-0000000AX



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

AH4-2/HP-2

MITSUBISHI ELECTRIC

COOLING & HEATING

M-SERIES

SUBMITTAL DATA: SEZ-KD09NA4** & SUZ-KA09NA

9,000 BTU/H HORIZONTAL-DUCTED HEAT-PUMP SYSTEMS

Job Name:	Location:	Date:
Purchaser:	Engineer:	
Submitted to:	For ☐Reference ☐Approval ☐Construction	
System Designation:	Schedule No.:	

****APPLIES TO INDOOR UNIT:**

- ☐ SEZ-KD09NA4
- ☐ SEZ-KD09NA4.TH
- ☐ SEZ-KD09NAR1.TH
- ☐ SEZ-KD09NA4R1.TH

Indoor Unit: SEZ-KD09NA4**

Outdoor Unit: SUZ-KA09NA

GENERAL FEATURES

- Horizontal-ducted indoor unit for concealed
- Ultra thin body: 7-7/8" high
- Built-in drain mechanism for condensate removal; lifts to 21-11/16"
- Air filter is included with indoor unit
- Quiet operation — as low as 23 dBA
- Indoor unit powered from outdoor unit using A-Control
- AUTO fan speed control
- Automatic restart following a power outage
- Limited warranty: five years parts and seven years compressors

ACCESSORIES

Indoor Unit

- ☐ Filter Box with MERV 8 Filters (FBL1-1)
- ☐ Bottom Return Plate (BRP-1)

Outdoor Unit

- ☐ Drain Socket (MAC-860DS)
- ☐ Drain Pan Heater (MAC-640BH-U)
- ☐ Three-pole Disconnect Switch (TAZ-MS303)
- ☐ Air Outlet Guide (MAC-856SG)
- ☐ Mounting Base (DSD-400N)
- ☐ Mounting Pad (ULTRILITE1)
- ☐ Wall-mounting Brackets (CWMB1)

Controller Options

- ☐ Wireless Wall-mounted Remote Controller Kit (MHK1)*
- ☐ Portable Controller (MCCH1)*
- ☐ Outdoor Air Sensor (MOS1)*

*See Submittal for information on each option.

- ☐ Wired Wall-mounted Controller (PAR-21MAAU)
- ☐ System Control Interface (MAC-333IF)
- ☐ Remote Temperature Sensor (M21-JKO-307)
- ☐ Hand-held Wireless Remote Controller (PAR-FL32MA; req.PAR-FA32MA-E)
- ☐ Wireless Signal Receiver Module PAR-FA32MA (for PAR-FL32MA-E)
- ☐ Lockdown Bracket for Hand-held Controller (RCMKP1CB)

R410A INVERTER

Specifications are subject to change without notice.

SPECIFICATIONS: SEZ-KD09NA4** & SUZ-KA09NA

Cooling*
Rated Capacity . . . . . 8,100 Btu/h
Capacity Range . . . . . 3,800 - 10,900 Btu/h
SEER 15.0
Total Input . . . . . 670 W

Heating at 47°F*
Rated Capacity . . . . . 10,900 Btu/h
Capacity Range . . . . . 4,800 - 14,100 Btu/h
HSPF 10.0
Total Input . . . . . 1,020 W

Heating at 17°F*
Rated Capacity . . . . . 6,700 Btu/h
Rated Total Input . . . . . 810 W
Maximum Capacity** . . . . . 6,700 Btu/h
Maximum Total Input . . . . . 1,000 W

*** Rating Conditions per AHRI Standard**
Cooling | Indoor: 80° F (27° C) DB / 67° F (19° C) WB
Cooling | Outdoor: 95° F (35° C) DB / 75° F (24° C) WB
Heating at 47°F | Indoor: 70° F (21° C) DB / 60° F (16° C) WB
Heating at 47°F | Outdoor: 47° F (8° C) DB / 43° F (6° C) WB
Heating at 17° F | Indoor: 70° F (21° C) DB / 60° F (16° C) WB
Heating at 17° F | Outdoor: 17° F (-8° C) DB / 15° F (-9° C) WB

**** Maximum Capacity is at full speed and performance for INVERTER-driven System.**

Electrical Requirements
Power Supply . . . . . 208 / 230V, 1-Phase, 60 Hz
Recommended Fuse/Breaker Size . . . . . 15 A

OPERATING CONDITIONS

		Indoor Intake Air Temp.	Outdoor Intake Air Temp.
Cooling	Maximum	90° F (32° C) DB 73° F (23° C) WB	115° F (46° C) DB
	Minimum	67° F (19° C) DB 57° F (14° C) WB	14° F (-10° C) DB
Heating	Maximum	80° F (27° C) DB 67° F (19° C) WB	75° F (24° C) DB 65° F (18° C) WB
	Minimum	70° F (21° C) DB 60° F (16° C) WB	-4° F (-20° C) DB -5° F (-21° C) WB

Voltage
Indoor - Outdoor S1-S2 . . . . . AC 208 / 230V
Indoor - Outdoor S2-S3 . . . . . DC ±24V

Indoor Unit
MCA . . . . . 1 A
Fan Type x Quantity . . . . . Sirocco Fan x 2
Blower Motor Type . . . . . Direct-driven DC Brushless Motor
Blower Motor Output . . . . . 96 W
Blower Motor (ECM) . . . . . 0.51 F.L.A.
Airflow (Lo - Med - Hi) . . . . . 194 - 247 - 317 Dry CFM
174 - 222 - 285 Wet CFM
Air Filter . . . . . Polypropylene Honeycomb
External Static Pressure . . . . . 0.02 - 0.06 - 0.14 - 0.20"WG
Sound Pressure Level (Lo - Med - Hi) . . . . . 23 - 26 - 30 dB(A)

DIMENSIONS	UNIT INCHES / MM
W	31-1/8 / 790
D	27-9/16 / 700
H	7-7/8 / 200

Weight . . . . . 42 lbs. / 19 kg
External Finish . . . . . Galvanized-steel Sheets
Field Drainpipe Size O.D. . . . . 1-1/4" / 32 mm

Outdoor Unit
Compressor . . . . . DC Inverter-driven
MCA . . . . . 12 A
MOCP . . . . . 15 A
Fan Motor (ECM) . . . . . 0.50 F.L.A.
Sound Pressure Level
Cooling . . . . . 46 dB(A)
Heating . . . . . 50 dB(A)

DIMENSIONS	INCHES / MM
W	31-1/2 / 800
D	11-1/4 / 285
H	21-5/8 / 550

Weight . . . . . 66 lbs. / 30 kg
External Finish . . . . . Munsell No. 3Y 7.8 / 1.1
Refrigerant Type R410A
Refrigerant Pipe Size O.D.
Gas Side . . . . . 3/8" / 9.52 mm
Liquid Side . . . . . 1/4" / 6.35 mm
Max. Refrigerant Pipe Length . . . . . 65' / 19 m
Max. Refrigerant Pipe Height Difference . . . . . 40' / 12 m
Connection Method . . . . . Flared

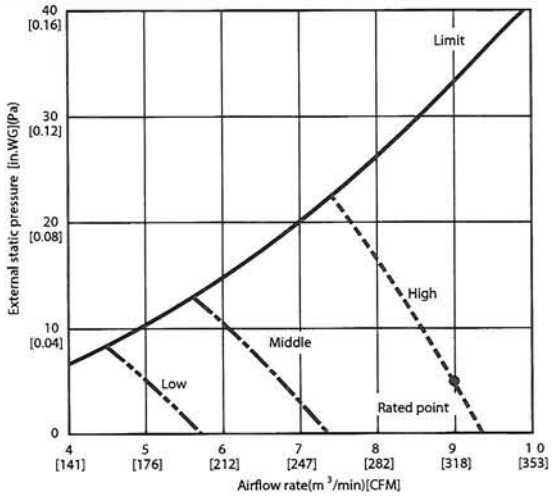
Notes:

Specifications are subject to change without notice.

SEZ-KD09NA4** INDOOR FAN PERFORMANCE AND CORRECTED AIR FLOW CHARTS

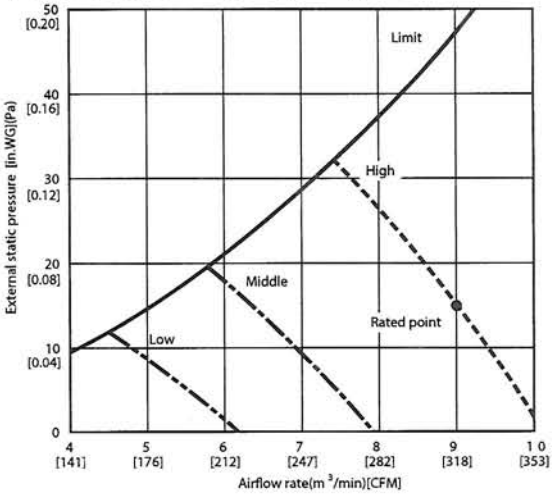
SEZ-KD09NA4**

(Exter nal static pressure 0.02[in.WG](5P a)) 208/230V 60Hz



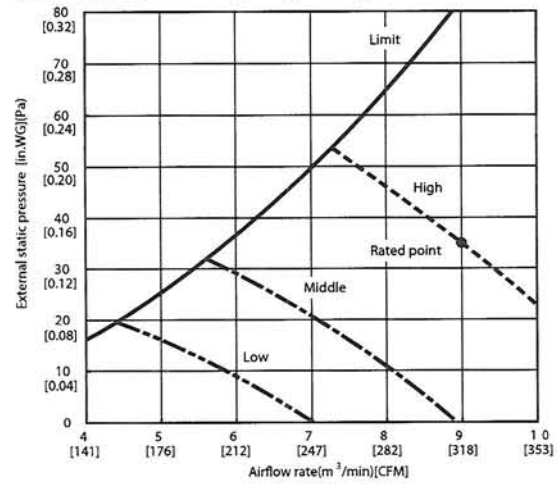
SEZ-KD09NA4**

(Exter nal static pressure 0.06[in.WG](15P a)) 208/230V 60Hz



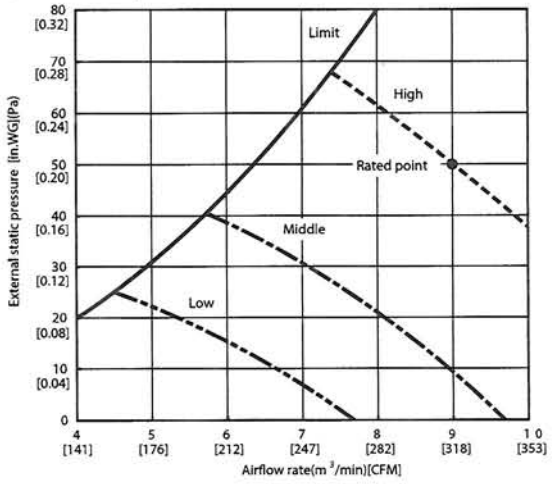
SEZ-KD09NA4**

(Exter nal static pressure 0.14[in.WG](35P a)) 208/230V 60Hz



SEZ-KD09NA4**

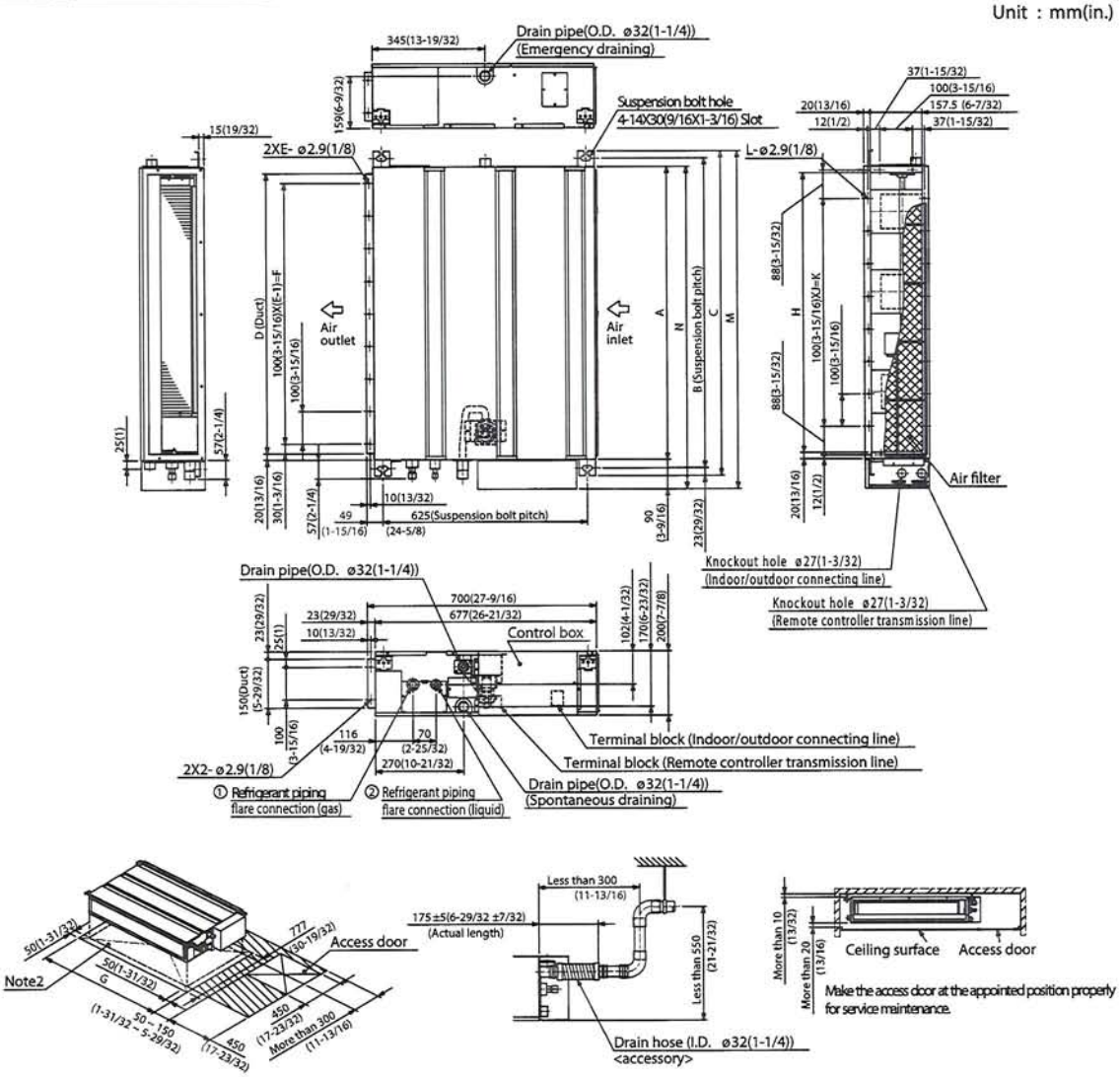
(Exter nal static pressure 0.20[in.WG](50P a)) 208/230V 60Hz



Specifications are subject to change without notice.

DIMENSIONS: SEZ-KD09NA4**

Unit : mm(in.)



Required space for service and maintenance

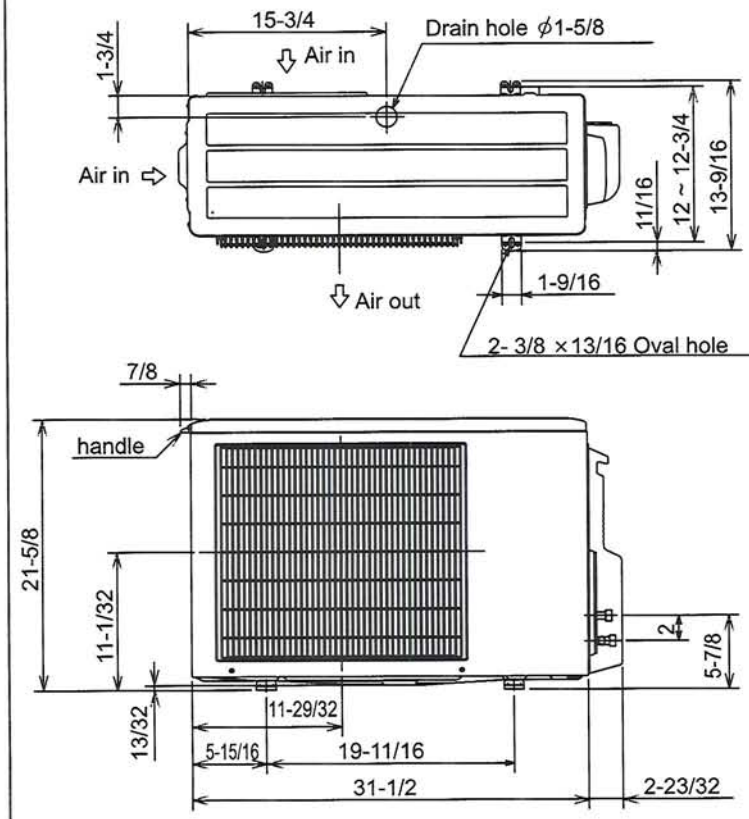
mm(in.)

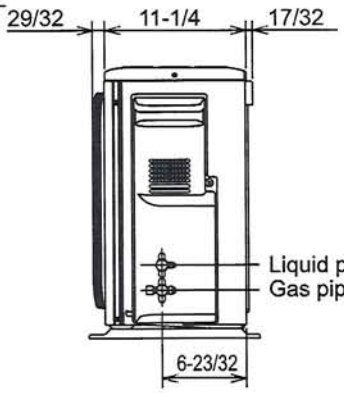
Model	A	B	C	D	E	F	G	H	J	K	L	M	N	① Gas pipe	② Liquid pipe
SEZ-KD09NA4**	700 (27-9/16)	752 (29-5/8)	798 (31-7/16)	660 (26)	7	600 (23-5/8)	800 (31-1/2)	660 (26)	5	500 (19-11/16)	16	839 (33-1/16)	790 (31-1/8)	ø9.52(3/8)	ø6.35(1/4)
SEZ-KD12NA4**	900 (35-7/16)	952 (37-1/2)	998 (39-5/16)	860 (33-7/8)	9	800 (31-1/2)	1000 (39-3/8)	860 (33-7/8)	7	700 (27-9/16)	20	1039 (40-29/32)	990 (39)		
SEZ-KD15NA4**														ø12.7(1/2)	
SEZ-KD18NA4**	1100 (43-5/16)	1152 (45-3/8)	1198 (47-3/16)	1060 (41-3/4)	11	1000 (39-3/8)	1200 (47-1/4)	1060 (41-3/4)	9	900 (35-7/16)	24	1239 (48-25/32)	1190 (46-7/8)		

Note1.Use M10 screw for the suspension bolt (field supply).
2.Keep the service space for the maintenance at the bottom.
3.This chart indicates for SEZ-KD15NA4** model,which has 3 fans.
SEZ-KD09,12NA4** models have 2 fans.
SEZ-KD18NA4** models have 4 fans.
4.In case an inlet duct is used,remove the air filter(supply with the unit), then install the filter(field supply) at suction side.

DIMENSIONS: SUZ-KA09NA

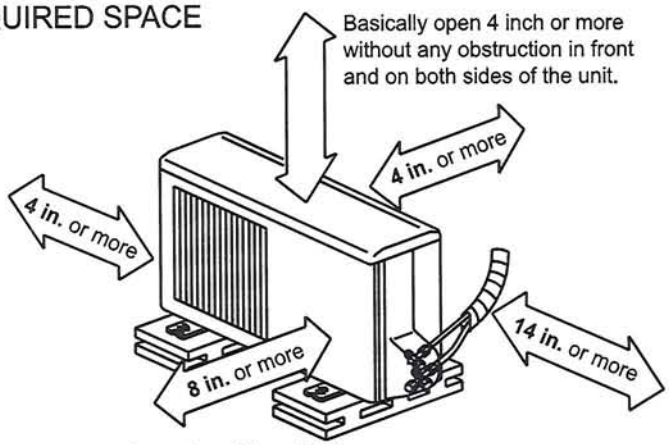
Unit: inch





Liquid pipe :1/4 (flared)
Gas pipe :3/8 (flared) **(KA09/12)**
1/2 (flared) **(KA15)**

REQUIRED SPACE



Open two sides of left, right, or rear side.

AHRI CERTIFIED™ www.ahridirectory.org
Unitary Small HP
AHRI Standard 210/240
Certification applies only when the complete system is listed with AHRI.

ETL LISTED US
Intertek

ENERGY STAR PARTNER

MITSUBISHI ELECTRIC
COOLING & HEATING
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FORM# SEZ-KD09NA4** & SUZ-KA09NA - 201304
Specifications are subject to change without notice.

MITSUBISHI ELECTRIC
HVAC Advanced Products Division

PRODUCT DATA SHEET

A-Control Disconnect Switch

☐ **Catalog #: TAZ-MS303**

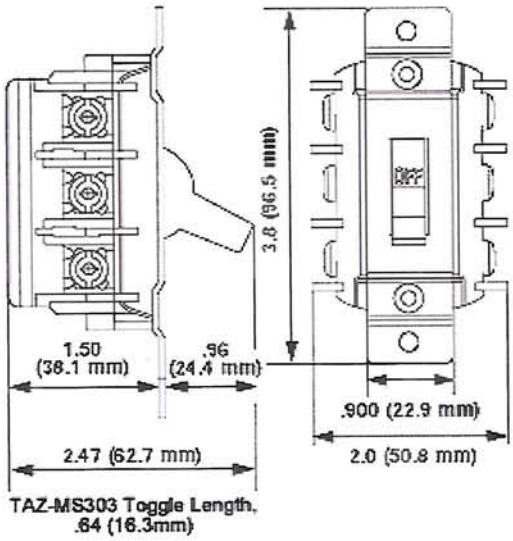
UPC# 07847702032

30 Amp, 600 Volt, Toggle Three-pole AC Switch, Industrial Grade, Non-grounding, Side Wired, - Black

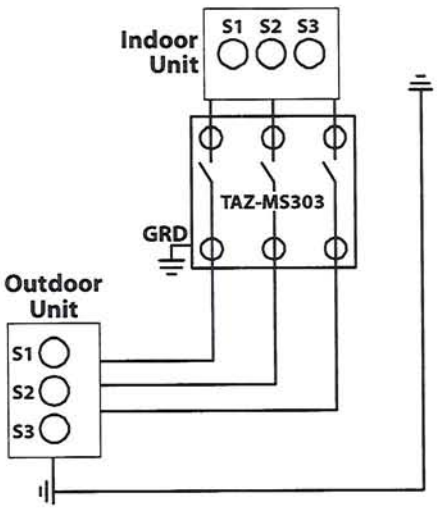
Product Features:

Three-pole

Ground:	Non-grounding
Amperage:	30 Amp
Voltage:	600 Volt
HP Rating:	3HP-120V 7-1/2HP-240V 15HP-480V 20HP-600V
Termination:	Side
Actuator Material:	Valox
Body Material:	Rynite
Strap Material:	Nickel-plated brass
Color:	Black
Standards and Certifications:	UL/CUL
Warranty:	10 year limited
Installation:	2" x 4" electrical wall box with switch cover plate (by others)



Wiring Diagram 3-Pole



SPECIFICATION SUBMITTAL

JOB NAME	CATALOG NUMBERS	Use with:
JOB NUMBER	TAZ-MS303	

Specifications subject to change without notice

Effective: 10/2/2006

Mitsubishi Electric Advanced Products Division
3400 Lawrenceville Suwanee Rd.
Suwanee, GA 30024

MITSUBISHI ELECTRIC
HVAC Advanced Products Division
#1 IN INNOVATION

Phone: 1-888-467-7546
Fax: 1-800- 658-1458

SDATACA11-09/06Y

FBL Series Filter Boxes

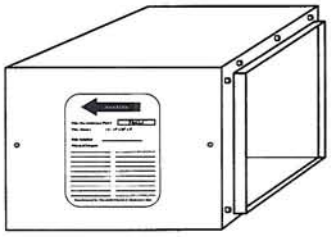
Designed for Mr. Slim® SEZ-KD-NA and PEA-A-AA Low-Static Indoor Units

Job Name: _____

Drawing Reference _____ Schedule No. _____

GENERAL FEATURES

- All filter boxes include 1" thick pleated MERV 8 filter(s) installed
  Rated MERV 8 when tested in accordance with ANSI/ASHRAE 52.2 Standard
  Rated Class 2 under U.L. Standard 900
- Cabinet is constructed of non-insulated 20 gauge G-60 galvanized steel
- Knurled thumb screws on access door allow easy filter replacement
- Foam gasket provides air-tight connection to indoor unit and access door
- Gasket material complies with UL 723 requirements
- Screw-through cabinet design for secure attachment to indoor unit
- Return connection in rear easily field converted to bottom
- Filter access door includes area to record maintenance schedule

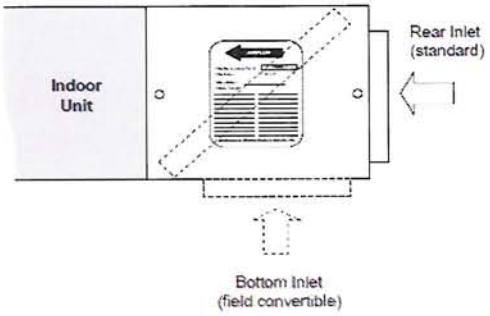


SPECIFICATIONS

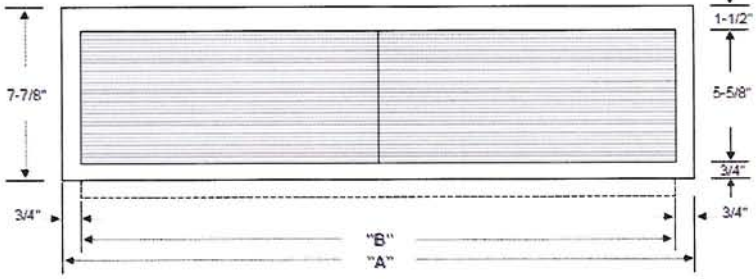
Part Number	Used on Mr. Slim Models	Filters Included	Ship Weight lbs.	Net Weight lbs.
FBL1-1	SEZ-KD09NA	(1) - 12" x 25" x 1"	15	12
FBL1-2	SEZ-KD12/15NA, PEA-A12AA	(1) - 12" x 20" x 1", (1) - 12" x 14" x 1"	18	15
FBL1-3	SEZ-KD18NA, PEA-A18AA	(2) - 12" x 20" x 1"	21	18

EXTERNAL DIMENSIONS

End View

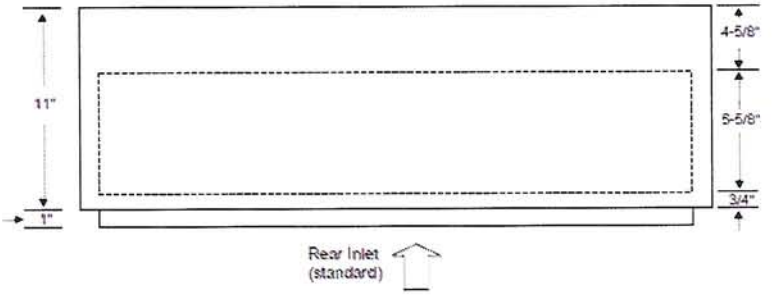


Back View (inlet air)



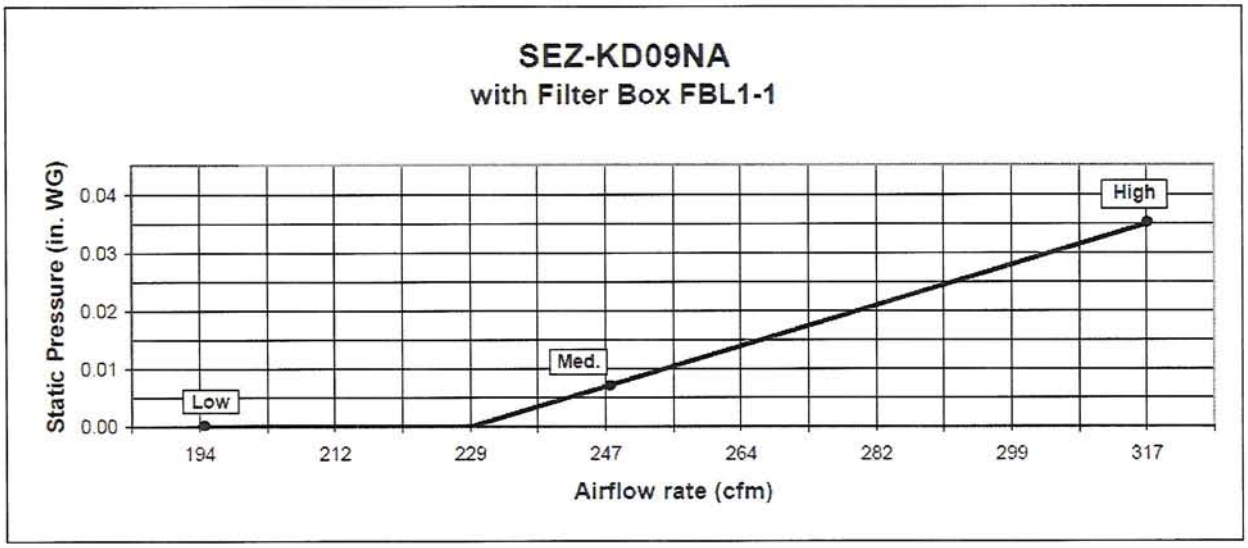
Model	"A"	"B"
FBL1-1	27-9/16"	26-1/16"
FBL1-2	35-7/16"	33-15/16"
FBL1-3	43-1/4"	41-3/4"

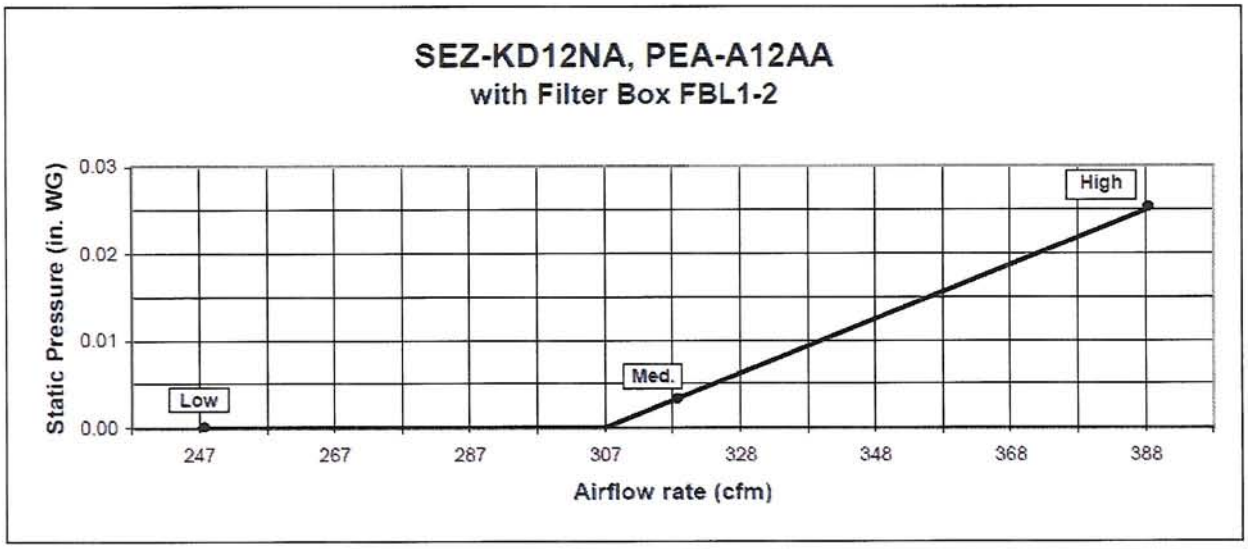
Top View

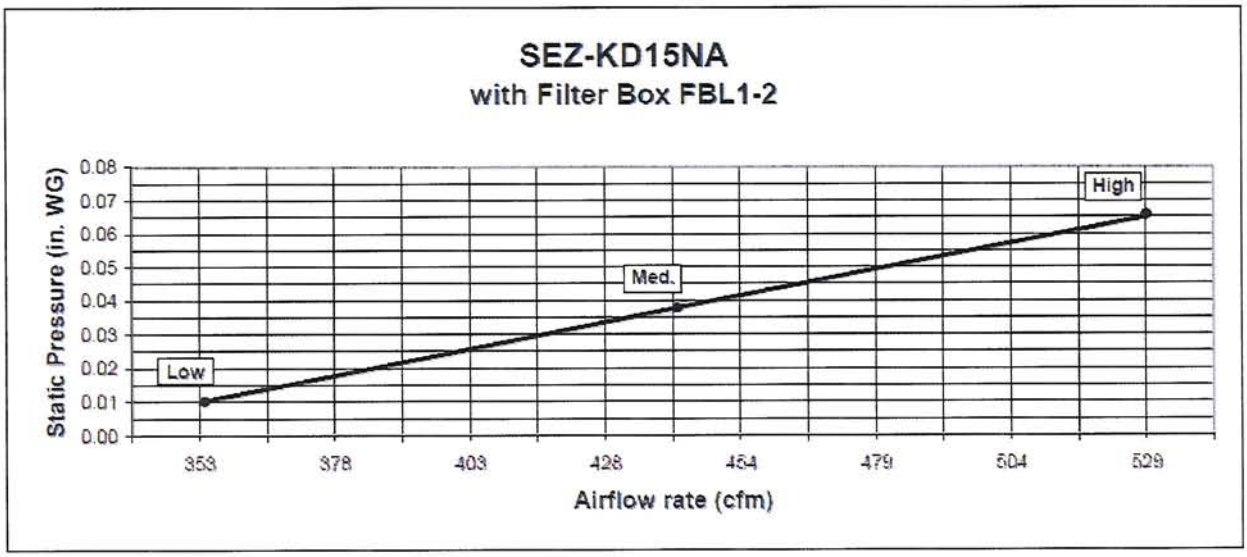


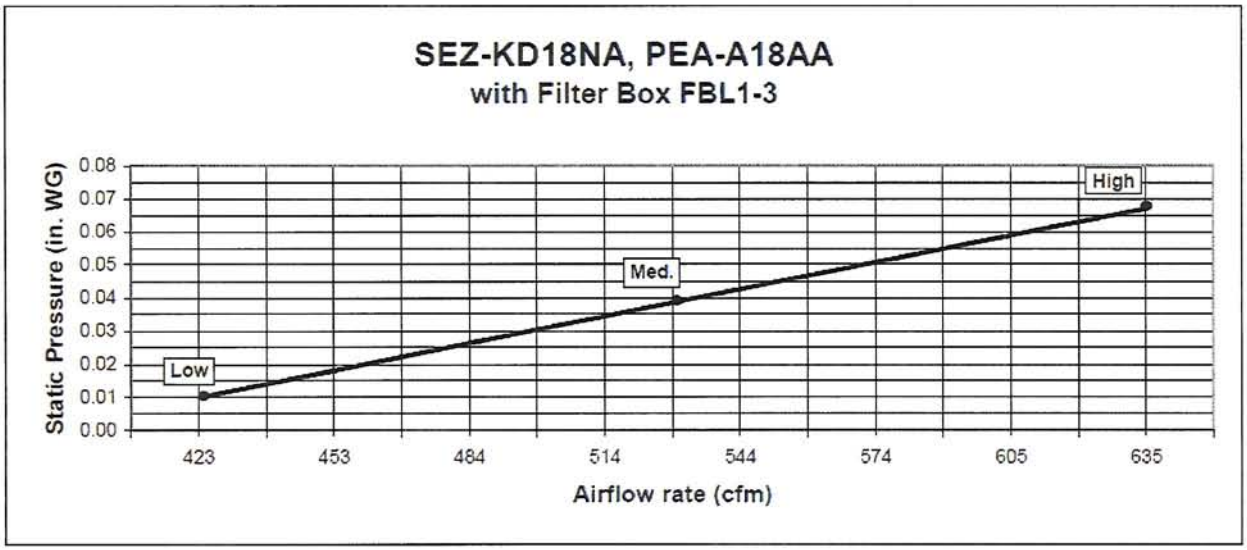
Manufactured for Mitsubishi Electric and Electronics USA

Initial Filter Pressure Drop with 1" MERV 8 Filter(s) Installed








SEZ-KD18NA, PEA-A18AA
with Filter Box FBL1-3
Static Pressure (in. WG)
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
High
Med.
Low
423
453
484
514
544
574
605
635
Airflow rate (cfm)

EF-1

COOK

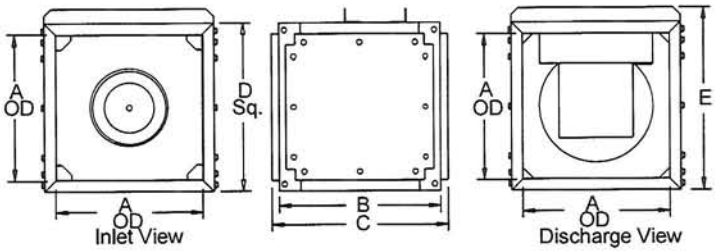
MARK: EF-1
PROJECT: FANS
DATE: 5/9/2013

SQN-D

Centrifugal Square Inline
Direct Drive

STANDARD CONSTRUCTION FEATURES:

All aluminum wheel - Galvanized steel housing - Three removable access doors - Closed cell neoprene gasketing - Inlet and discharge duct collars - Universal mounting feet - Permanently lubricated motor - Transit tested packaging.



Performance

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Input Watts
1	100SQN15D	600	.500	1539	166

Altitude (ft): 0 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	TOL
1/6	1550	115/1/60	TENV -SE	Yes

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
62	64	66	64	62	60	53	47	67	56	7.2

Dimensions (inches)

A	12
B	20
C	22
D Sq.	14
E	15-9/16

NOTE: Accessories may affect dimensions shown.

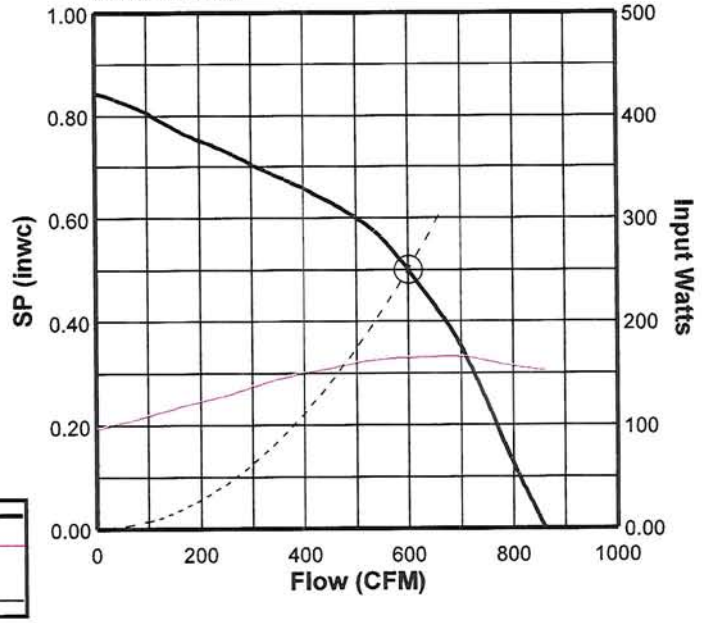
Shipping Weight(lbs)***	109

***Includes fan, motor & accessories.

Accessories:

STD DISCONNECT PREWIRED
BDM-12 MTR DPR 115V
FAN SPEED CONTROLLER 5A 120V PREWIRED
RC-75 SET(4) - ISOLATORS

Fan Curve



Fan Curve Legend

CFM vs SP	
CFM vs Watts	
Point of Operation	○
System Curve	

COOK

PROJECT: FANS
DATE: 5/9/2013

BDM

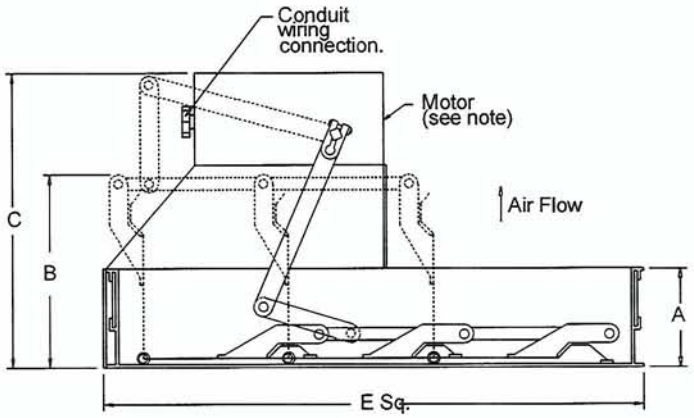
Motorized Backdraft Damper

STANDARD CONSTRUCTION FEATURES:

.020 aluminum blades - .060 aluminum frame - Aluminum hinge pins - Brass bushings - Non-overloading motor.

Notes:

Max operating temperature 130 Deg F (50 Deg C)



Dimensions (inches)

Mark	Qty	Description	A	B Max	C	E Sq.	# Motors
EF-1	1	BDM-12 MTR DPR 115V	1-7/8	5-3/16	8	11-3/4	1

COOK

PROJECT: FANS
DATE: 5/9/2013

FSC

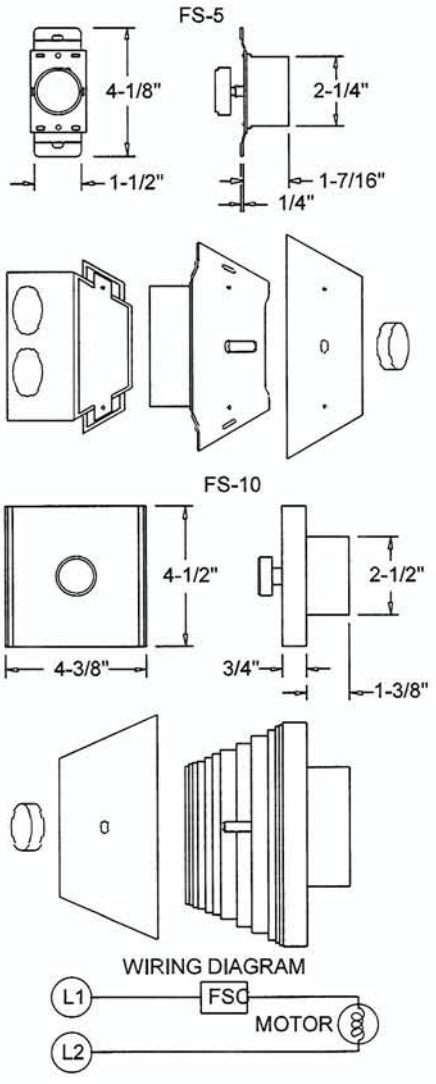
Fan Speed Controls

STANDARD CONSTRUCTION FEATURES:

PRODUCT DESCRIPTION - Through the "Quadrac" integrated semi-conductor device it is now possible to offer this system with many advantages. Fewer semi-conductor parts mean greater reliability and the passivation process used in the manufacture of the semi-conductor insures long life. Printed circuit construction eliminates wiring difficulties and guarantees workmanship. All of these factors serve to offer the most important of all features - quality. SPEED CONTROL - Positive Off/On action in the control dial. Speed range set to the customer's requirements. CONTROL RATING - 120 volts, 60 cycles, 1 phase. Maximum ambient temperature - 120 degree F (5 AMP, 10 AMP, 15 AMP). 220/240 volt, 50/60 cycles, 1 phase. Maximum ambient temperature - 120 degree F (5 AMP, 10 AMP). 220/240 volt model not UL listed. Fan cannot have UL listing if furnished with prewired 220/240 volt FSC. 277 volt, 60 cycles, 1 phase. Maximum ambient temperature - 120 degree F (5 AMP). WARNING - Power must be turned off before installing this unit. STANDARD INSTALLATION - Fits any standard single gang box. Turn off power and connect the two wires on the control to the two switch wires in the usual manner. The connection box is not supplied. SPECIAL FEATURES - Complete range control, solid state "Quadrac" integrated circuitry, solid state construction for long reliable operating life, saves on electric bills.

Dimensions (inches)

Mark	Qty	Description
EF-1	1	FSC 5A 120V PREWIRED



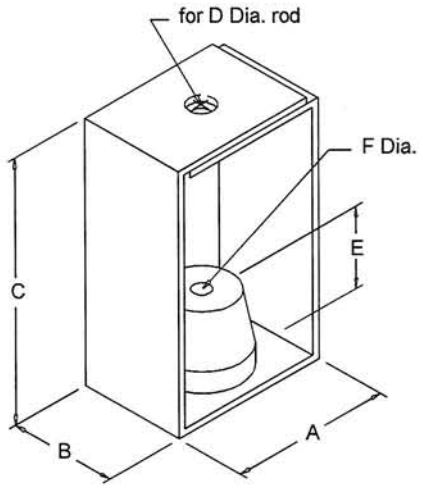
COOK

PROJECT: FANS
DATE: 5/9/2013

RIS CEILING

Rubber-In-Shear Isolator Ceiling Mounted

NOTE:
Dimensions are for informational purposes only - Not for construction.



Dimensions (inches)

Mark	Qty	Description	A	B	C	D	E	F
EF-1	1	RC-75 SET(4)	2-5/32	1-1/2	2-23/32	11/16	15/32	3/8

AC-1, AC-2

SECTION 15831 - AIR CURTAINS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Air curtains.

1.02 RELATED REQUIREMENTS

A. Section 16155 - Equipment Wiring: Connection to building power.

1.03 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's descriptive literature for products specified in this section; indicate options specified.

C. Manufacturer's instructions: Printed installation instructions for each product specified.

D. Shop Drawings: Indicate installation and connection details for air curtains.

E. Operation and Maintenance Manuals: Include in manuals the information listed below. For information on how to prepare and submit manuals see section 1780 (Closeout Submittals).
   1. Local representative
   2. Recommended spare parts
   3. Spare parts lists
   4. Operating instructions
   5. Maintenance instructions, including preventative and corrective maintenance.
   6. Copies of warranties
   7. Wiring diagrams
   8. Shop drawings and product data

1.04 DELIVERY, STORAGE, AND HANDLING

A. Store products of this section in manufacturer's unopened packaging until installation.

B. Maintain dry, heated storage area for products of this section until installation of products.

1.05 WARRANTY

A. Supply manufacturer's standard warranty against defects in product workmanship and materials.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Berner International Corp.: www.berner.com.

B. MARS Air Systems: www.marsair.com.

C. Substitutions: See Section 01600 - Product Requirements.

2.02 AIR CURTAINS

A. Product Description: Self-contained electrically-operated air curtain for mounting at head of door openings.
   1. Maximum Mounting Height: 7 feet.

B. Motor Fan Assembly: Design for easy removal, assembly, repair and maintenance.
   1. Motor: Totally enclosed air over (TEAO) cooled motor with sealed lifetime pre-lubricated ball bearings, motor starter and thermal overload protection.
   2. Electrical Characteristics: 115V AC, single phase; 2.4 Amp (units up to 48 inches wide) or 2.6 Amp (units 60 to 72 inches wide) full load per motor/fan.
   3. Fans: Forward curved centrifugal type, double width, and double inlet design, directly driven to an electric motor.
   4. Provide resilient isolation dampening mountings between motor frame and motor mounting pan.
   5. Factory balanced blower wheel assembly statically and dynamically.

C. Housing: Self contained one-piece type with sufficient strength for mounting from pre-punched mounting holes at both ends to adjacent walls or ceiling without intermediate support.
   1. Size:
      a. Unheated: 10-3/4 inches deep by 8 inches high (including discharge nozzle) by width of unit.
   2. Mounting:
      a. Unheated Inside Mount.
   3. Material:
      a. Provide 18 and 20 gauge electro or hot dipped galvanized steel sheet housing conforming to ASTM A 591 and/or ASTM A 653.
   4. Air Inlet Grille and/or Filters: Provide air inlet grille and/or filters specified.
   5. Discharge: Provide integral discharge nozzle specified.
   6. Finish and Color: Provide with, no VOC, corrosion resistant polyurethane powder coated finish for sheet steel housings.
      a. Custom color as selected by the Architect.

D. Insect Control Air Curtains: Models for Concession Stand Heights to 4 feet (1219 mm) or Customer Entry Heights to 7 feet (2134 mm) certified to NSF/ANSI Standard 37.
   1. Discharge Nozzle: Wedge-shaped discharge outlet nozzle with adjustable air foil vanes with a plus/minus 40 degree sweep front to back.
   2. Air Velocity at Nozzle:
      a. 1800 feet/min
   3. Air Speed at Floor:
      a. Customer entry doors require a minimum of 600 fpm (3.05 m/s) at 3 feet (914 mm) from floor.
   4. Air Inlet Grille and Filters:
      a. Location: Front.
      b. Speed: 625 cu ft/min (295 L/s), minimum, per motor/fan assembly.
      c. Type: Fixed air intake grille.

2.03 COMPONENTS

A. Door-Activated Limit switch(s): Provide, field installed 115-Volts, 20 amps limit switch to control air curtain(s) as follows; Automatic on/off control, activates air curtain when door is opened and turns off when door is closed. Provide limit switch for direct control one 1 HP or up to two 1/2 HP single phase motors without a separate control panel.
   1. Type: Combination plunger/roller switch for swing and sliding doors.
      a. Provide limit switches with NEMA 1 (20 amps) ratings in locations indicated.
   2. Operation for Unheated Units: Automatic on/off control, on when door is opened, off when door is closed.

3. Provide mounting hardware as required for the opening.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that required utilities are in correct location and are of correct capacities for specified products.

B. Verify that mounting surfaces have sufficient strength to support units.

C. Verify that space is ready for installation of units.

D. Verify clearances required to maintain the units.

E. Verify openings to receive air curtains are plumb, level, square, accurately aligned, correctly located, and in tolerance.

3.02 INSTALLATION

A. Install air curtains in accordance with shop drawings and manufacturer's printed installation instructions.

B. Maintain clearances required to maintain the units.

C. Ensure proper connection to utilities.

D. Install air curtains plumb, level, square, true to line, and weathertight, without warp or rack.

E. Anchor air curtains securely in place to supports.

F. Install electrical power as specified in Section 16100.

G. Install door limit switches and adjust for correct operation.

END OF SECTION

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LoPro (LPV2) Series 2 (/content/lopro-lpv2-series-2)

Our LPV series is the anchor of or LoPro series. Sleek, quiet, with a consumer-friendly design that makes it perfect for customer facing, commercial installations and also has a variable speed control, allowing you to turn the air column up or down to suit your needs. It has 1/6 HP motor, the standard color is Obsidian Black and heated options are available. For Sanitation Certified versions of this model, click here: ETL Sanitation Certified (etl-sanitation-certified-lopro-drive)

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OVERVIEW MODELS ACCESSORIES RELATED APPLICATIONS DOWNLOADS

DOOR SWITCHES
Automatic on/off control of air curtain as door is opened and closed

Line Voltage

- 99-014 Door Limit Switch - Combination roller and plunger · 20 amps, 250v, or 1 hp max.

24-Volt Control

- 99-018 Commercial Magnetic Reed Switch Only - Plastic · Surface-mounted · NOTE: Used with control packages J0023 or J0024 for double doors

CONTROL PACKAGES
Combination packages of door switches, controllers, time delays, and thermostats

Line Voltage

- J0043 Door Limit Switch with Adjustable Time Delay. 1 sec. – 10 min. · Surface-mounted
- J0044 Door Limit Switch with Adjustable Time Delay and Analog Thermostat. 1 sec. – 10 min ·Surface-mounted switch, remote-mounted thermostat
- 99-063 Analog Thermostat - Remote-mounted
- 99-064 Analog Thermostat DPST - Double pole, single throw · Acts as heat on demand Remote-mounted

24-Volt Control
- J0021 Commercial Magnetic Reed Switch with Controller and Adjustable Time Delay · 115v - 6 sec. – 20 min. · Plastic · Surface-mounted
- J0022 Commercial Magnetic Reed Switch with Adjustable Time Delay ·208-230v 1? - 6 sec. – 20 min. · Plastic · Surface-mounted
- J0023 Commercial Magnetic Reed Switch with Controller · 115v - Plastic · Surface-mounted
- J0024 Commercial Magnetic Reed Switch with Controller · 208-230v 1? - Plastic · Surface-mounted
- J0028 Door Limit Switch with Controller and Adjustable Time Delay ·115v - 6 sec. – 20 min. · Surface-mounted
- J0029 Door Limit switch with Controller and Adjustable Time Delay ·208-230v 1? - 6 sec. – 20 min. · Surface-mounted
- J0046 Commercial Magnetic Reed Switch with Internal Transformer ·208-230v 1? and 3? - Plastic · Surface-mounted
- J0047 Commercial Magnetic Reed Switch with Internal Transformer ·460v 3? - Plastic · Surface-mounted
- J0049 Commercial Magnetic Reed Switch with Adjustable Time Delay and Analog Thermostat · 208-230v 1? and 3? - 1 sec. - 17 min. · Plastic · Surface-mounted switch, remote-mounted thermostat
- J0050 Commercial Magnetic Reed Switch with Adjustable Time Delay and Analog Thermostat · 460v 3? - 1 sec. - 17 min. · Plastic · Surface-mounted switch, remote-mounted thermostat
- J0051 Commercial Magnetic Reed Switch with Adjustable Time Delay ·208-230v 1? and 3? - 1 sec. - 17 min. · Plastic · Surface-mounted
- J0052 Commercial Magnetic Reed Switch with Adjustable Time Delay ·460v 3? - 1 sec. - 17 min. · Plastic · Surface-mounted

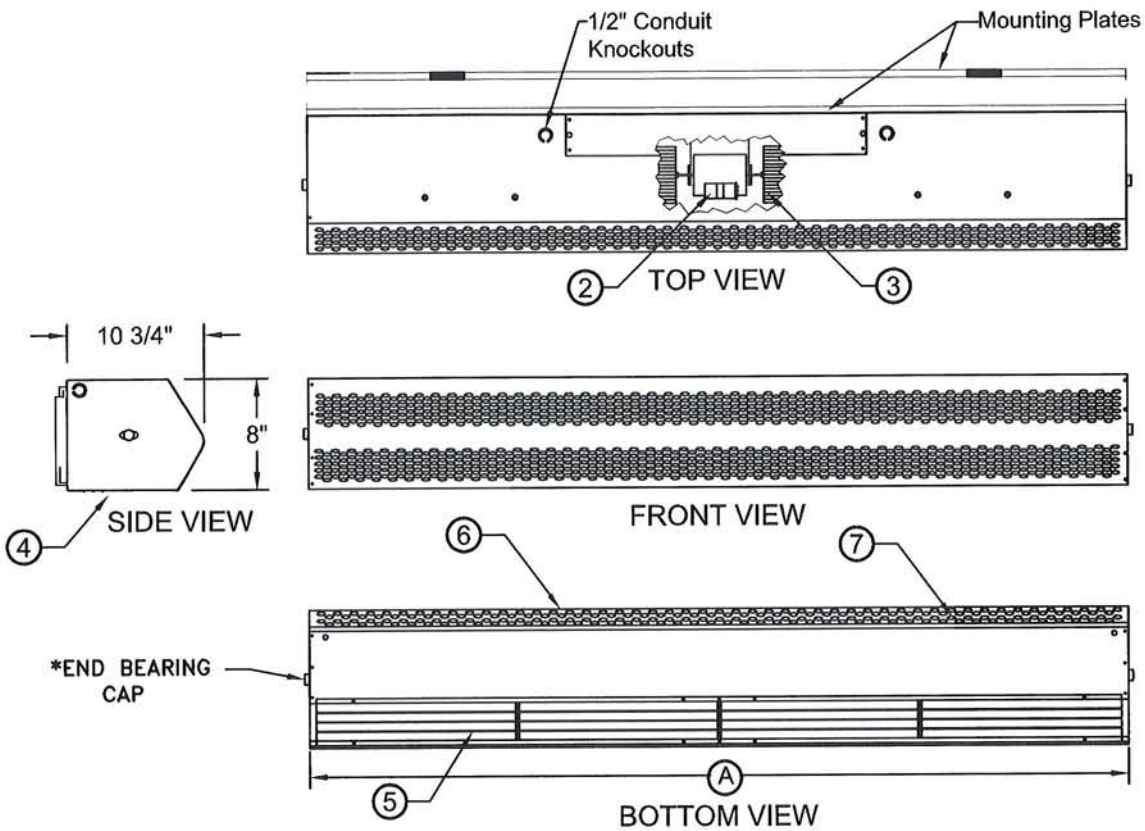
MOUNTING BRACKETS
Recommended for specific applications · Standard color: Obsidian Black · NOTE: Units come standard with predrilled holes on back end for flush mounting

- J0041 Transom Mounting Brackets - For glass-frame doors · Set of 2 · Standard color Obsidian Black
- 98-061 Easy install Top Mounting Kit - For units longer than 72" use 2 kits · Standard color Obsidian Black
- J0120 Tandem Mounting Kit - Used when multiple units are mounted side-by-side · Standard color Obsidian Black

- J0121 Tandem Mounting Kit - Used when multiple units are mounted side-by-side · Standard color Obsidian Black
- J0032 Walk-In Installation Kit · 115v - Includes: Magnetic reed switch · Controller · Nylon bolt
- J0033 Walk-In Installation Kit · 208-230v 1? - Includes: Magnetic reed switch · Controller · Nylon bolt

FILTERS

- LP2-FILTER-[size] LP2 Aluminum Mesh Filter 1/4' - Internal-mount · Set of 2 · [size]: Specify size in inches

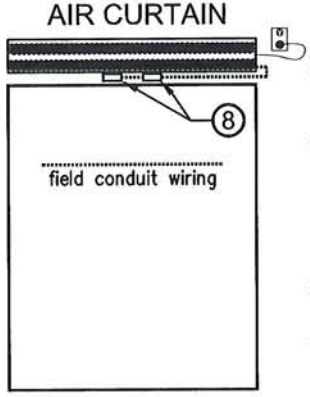


NOTES:

1. This product is designed to meet the National Electric Code (NEC) and is ETL Listed for the US and Canada and NSF/ANSI Standard 37.
2. Continuous duty, direct drive, single speed, double shaft motors with automatic thermal overload protection. Overload protects motor from burnout, minimizing maintenance costs. Motor connected with an 8' cord, three conductor cord and plug.
3. Blower wheels are rust proof and dynamically balanced to provide quiet operation, while maintaining high air velocity.
4. Low profile appearance. Overall height is 8" and overall depth is 10 3/4".
5. Air directional vanes, with 40° sweep front to back, compensates for drafts.
6. Countertop or consession applications are denoted with an-F at the end of the model numbers and supplied with washable aluminum filters. LPN25, LPN28 & LPN30 include the washable aluminium filters as standard.
7. All units have a self contained one piece cabinet, fire retardant and corrosion proof paint lock metal, double protected with Obsidian Black rust preventative electrostatic powder coatin. Units greater than 72" are double units joined with a 2"mounting bracket located in the center, field installed.
8. Normally closed door limit switch(es) is optional and field installed. Switch to be mounted so the air curtain turns on as the door begins to open.

*BEARING CAP ADDS 1/2" TO UNIT LENGTH

MODEL NUMBER	UNIT LENGTH (A)
LPN25-1U	25"
LPN28-1U	28"
LPN30-1U	30"
LPN36-1U	36"
LPN42-1U	42"
LPN48-1U	48"
LPN60-1U	60"
LPN72-1U	72"
LPN84-2U	86"
LPN96-2U	98"
LPN108-2U	110"
LPN120-2U	122"
LPN144-2U	146"



TYPICAL INSTALLATION

1- Install Mounting plate(s) using the pre-drilled holes.

2- Securely attach cabinet to mounting plate using tabs as guides, when fully inserted secure with (2) #10 Tek Screws.
"CAUTION": Unit to be mounted with the lowest moving part at least 7 Feet above floor or grade level.

3- Install optional door limit switch(es) to door header. (8)

4- Plug in unit using the 3-wire cord / plug supplied.

PROJECT	Model No.:
	Drawing No.:
LOCATION	Date
ARCHITECT	Sheet of
	Drawn By:
ENGINEER	Checked By:

MARS®
AIR SYSTEMS
14716 S. BROADWAY · GARDENA, CA 90248 · USA
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Web Site: www.marsair.com · E-mail:info@marsair.com

LoPro (LPN) 1/6 HP NSF COMMERCIAL UNHEATED MODELS

JOB: **ARCHITECT/ENGINEER:** **DRWG.:** _____

CONTRACTOR: **SHEET** ____ **of** ____ **DATE:** _____

MARK	MODEL NUMBER	NUMBER REQ'D	OVERALL LENGTH (INCHES)	MOTOR HP @ 1550 RPM**	WEIGHT (LBS)	MOTOR FAN DATA					REMARKS
						FLA* SINGLE PHASE		Max FPM** at Nozzle	Max CFM** at Nozzle	dBA Measured 10 ft. from Nozzle	
						115V	208/230V				
	LPN25–1U		25	1 @ 1/6	24	2.4	1.2/1.2	1800	625	49	
	LPN28–1U		28	1 @ 1/6	25	2.4	1.2/1.2	1800	700	49	
	LPN30–1U		30	1 @ 1/6	28	2.4	1.2/1.2	1800	750	49	
	LPN36–1U		36	1 @ 1/6	35	2.4	1.2/1.2	1800	900	49	
	LPN42–1U		42	1 @ 1/6	38	2.4	1.2/1.2	1800	1050	50	
	LPN48–1U		48	1 @ 1/6	42	2.4	1.2/1.2	1800	1200	52	
	LPN60–1U		60	1 @ 1/6	51	2.6	1.4/1.4	1800	1500	53	
	LPN72–1U		72	1 @ 1/6	61	2.6	1.4/1.4	1800	1800	53	
	LPN84–2U		86	2 @ 1/6	79	4.8	2.4/2.4	1800	2100	53	
	LPN96–2U		98	2 @ 1/6	87	4.8	2.4/2.4	1800	2400	53	
	LPN108–2U		110	2 @ 1/6	96	5.0	2.6/2.6	1800	2700	54	
	LPN120–2U		122	2 @ 1/6	105	5.2	2.8/2.8	1800	3000	54	
	LPN144–2U		146	2 @ 1/6	125	5.2	2.8/2.8	1800	3600	54	

EQUIPMENT SPECIFICATIONS – Standard Features

GENERAL
Air curtain shall be a Mars® Air Doors brand air curtain: LoPro NSF Commercial unheated.

APPROVALS
Air curtain shall meet the requirements of the National Electric Code. (N.E.C.) and ETL Listed for US & Canada and NSF/ANSI Standard 37.

CABINET
Cabinet shall be a self contained one piece housing with sufficient strength for fastening to wall on both ends without intermediate support. Cabinet constructed of fire retardant, corrosion proof paint lock metal and double protected with Obsidian Black baked rust preventative electrostatic polyurethane powder coating. Discharge air outlet nozzle is internal wedge shaped containing adjustable air direction aluminum vanes with 40° sweep front to back. Motor & Fans are easily accessible for maintenance. Countertop or concession applications are denoted with an –F at the end of the model number and supplied with washable aluminum filters. LPN25, LPN28 & LPN30 include the washable aluminium filter as standard.

MOTORS AND BLOWER WHEELS
Motor(s) shall be totally enclosed air over (TEAO) type suitable for continuous heavy duty, all angle operation. Construction shall include sealed lifetime pre–lubricated ball bearings, resilient mounted and protected by an automatic reset thermal overload switch. Motor(s) to have double extended shaft and direct drive, cross flow blower wheels.

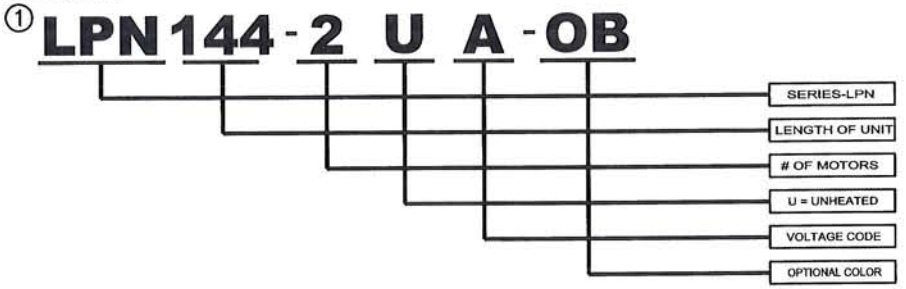
ELECTRICAL WIRING
Unit supplied with 1/2" Conduit Knockouts.

GUARANTEE
Shall be 5 years on all parts.

ACCESSORIES
Refer to optional features and accessories page.

***- For Ampacity Multiply FLA X 1.25**
****- 17% Reduction in Performance on units with 50Hz.**

EXAMPLE



SIZE	VOLTAGE	CODE
25"-144"	115/1/60	A
25"-144"	208-230/1/60	D
25"-144"	220/1/50	U

COLOR	CODE
OBSIDIAN BLACK	OB
TITANIUM SILVER	TS
PEARL WHITE	PW
SPARTAN BRONZE	SB
BATTLESHIP GRAY	BG

MADE WITH PRIDE IN THE U.S.A.