

SECTION 23 73 13

MODULAR INDOOR CENTRAL-STATION AIR-HANDLING UNITS

11/08

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AIR MOVEMENT AND CONTROL ASSOCIATION INTERNATIONAL (AMCA)

AMCA 99 (2003) Standards Handbook

AIR-CONDITIONING, HEATING AND REFRIGERATION INSTITUTE (AHRI)

AHRI 430 (1999) Standard for Central-Station Air-Handling Units

AHRI 880 (1998; Addendum 2002) Standard for Air Terminals

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)

ASHRAE 52.1 (1992; Interpretation 1 2007) Gravimetric and Dust-Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter

ASTM INTERNATIONAL (ASTM)

ASTM A 653/A 653M (2008) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

ASTM B 117 (2007a) Standing Practice for Operating Salt Spray (Fog) Apparatus

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO 1940-1 (2003; Corrigendum 2005) Mechanical Vibration - Balance Quality Requirements for Rotors in a Constant (Rigid) State - Part 1: Specification and Verification of Balance Tolerance - International Restrictions

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA MG 1 (2007; Errata 2008) Standard for Motors and Generators

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 90A (2008) Standard for the Installation of
Air Conditioning and Ventilating Systems

UNDERWRITERS LABORATORIES (UL)

UL 900 (2004; Rev thru Nov 2007) Standard for Air
Filter Units

1.2 GENERAL REQUIREMENTS

Section 23 00 00 AIR SUPPLY, DISTRIBUTION, VENTILATION, AND EXHAUST SYSTEMS
applies to work specified in this section.

Submit Equipment and Performance Data for air handling units in accordance
with the specification. Provide data that consists of use life, total
static pressure and coil face area classifications, and performance ratings.

Submit drawings and manuals that include a spare parts data sheet, with
manufactures recommended stock levels.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation;
submittals not having a "G" designation are for Contractor Quality Control
approval. Submit the following in accordance with Section 01 33 00
SUBMITTAL PROCEDURES:

SD-03 Product Data

Submit Equipment and Performance Data for air handling units in
accordance with paragraph entitled, "General Requirements," of
this section.

Submit Manufacturer's catalog data for the following items:

Unit Cabinet
Fan
Drain Pans
Insulation
Plenums

SD-10 Operation and Maintenance Data

Submit Operation and Maintenance Manuals for air handling units in
accordance with paragraph entitled, "Operation and Maintenance,"
of this section.

PART 2 PRODUCTS

2.1 AIR HANDLING UNIT (AHU)

Provide central-station type, factory fabricated, and sectionally assembled
air handling unit (AHU). Provide AHU that includes components and
auxiliaries in accordance with AHRI 430. Balance AHU fan and motor to
ISO 1940-1-2005.

Provide total static pressure and coil face area classification that conform to AMCA 99.

Fans with enlarged outlets are not permitted.

2.2 UNIT CABINET

Provide AHU cabinet that is suitable for pressure class shown and that has leaktight joints, closures, penetrations, and access provisions. Provide cabinet that does not expand or contract perceptibly during starting and stopping of fans and that does not pulsate during operation. Reinforce cabinet surfaces with deflections in excess of 0.004167 of unsupported span prior to acceptance. Stiffen pulsating panels, which produce low frequency noise due to diaphragming of unstable panel walls, to raise natural frequency to an easily attenuated level. Fabricate enclosure from continuous hot-dipped galvanized steel no lighter than 20 gage thickness, to match industry standard. Provide mill-galvanized sheet metal that conforms to ASTM A 653/A 653M and that is coated with not less than 1.25 ounces of zinc per square foot of two-sided surface. Provide mill-rolled structural steel that is hot-dip galvanized or primed and painted. Corrosion protect cut edges, burns, and scratches in galvanized surfaces. Provide primed and painted black carbon steel cabinet construction that complies with this specification.

Provide removable panels to access the interior of the unit cabinet. Provide seams that are welded, bolted or gasketed and sealed with a rubber-based mastic. Make entire floor as well as ceiling unit hot-dipped galvanized steel. Provide removable access doors on both sides of all access, filter, and fan sections for inspection and maintenance.

Provide AHU cabinet suitable for pressure class indicated with leaktight joints, closures, penetrations, and access provisions. Provide cabinet that does not expand or contract perceptibly during starting and stopping of fans and that does not pulsate during operation. Reinforce cabinet surfaces with deflections in excess of 0.002778 of unsupported span prior to acceptance by the Contracting Officer. Stiffen pulsating panels, which produce low frequency noise due to diaphragming of unstable panel walls, to raise natural frequency to an easily attenuated level. Provide enclosure that is fabricated from mill-galvanized or primed and painted carbon steel sheet of required thickness. Provide mill-galvanized sheet metal that conforms to ASTM A 653/A 653M and that is coated with not less than 1.25 ounces of zinc per square foot of two-sided surface. Provide mill-rolled structural steel that is hot-dip galvanized or primed and painted. Corrosion protect edges, burns, and scratches in galvanized surfaces. Provide primed and painted black carbon steel cabinet construction that complies with this specification.

Provide removable panels to access the interior of the unit cabinet. Provide seams that are welded, bolted or gasketed and sealed with a rubber-based mastic. Make entire floor as well as ceiling unit hot-dipped galvanized steel. Provide removable access doors on both sides of all access, filter, and fan sections for inspection and maintenance.

Where cabinet size is such that personnel access is possible, strengthen cabinet floor to permit entry without damage to any component. Hinge and latch access doors and panels at a spacing sufficiently close to preclude leaks caused by distortion, and effectively gasket.

Black carbon steel cabinet construction is acceptable when the following conditions are met:

Coat all interior and exterior surfaces, including lapped contacting surfaces, with a corrosion-protective coating.

Certify coating as passing a 500-hour exposure salt-spray fog test in accordance with ASTM B 117.

Immediately after completion of the test, provide a specimen that shows no signs of wrinkling, cracking or loss of adherence, and no signs of rust creepage beyond 1/8 inch on either side of the scratch mark.

Ensure inspection of interior and exterior cabinet surfaces will pass examination for the same defects as the salt-spray fog test specimen, after 11 months of service and prior to expiration of guarantee.

Interior surfaces of cabinets constructed of intact mill-galvanized steel require no further protection.

Provide cabinets with exterior surfaces constructed of mill-galvanized steel that are [left unpainted] [painted] [prepared by a phosphatizing treatment, and painted with two coats of manufacturer's standard enamel finish in color selected by the Contracting Officer].

Provide cabinets and casings that are double walled with 2 inch insulation. Provide interior wall that is galvanized.

Dynamically and statically balance fan wheels at the factory. Provide fan with RPM that is 25 percent less than the first critical speed. Provide fan shaft that is solid, ground and polished steel and coated with a rust inhibitor. Provide V-belt driven fans that are designed for 50 percent overload capacity. For variable air volume air handling units that are provided with variable frequency drives, have their fans balanced over the entire range of operation (20 percent - 100 percent RPM). Balancing fans of only 100 percent design of RPM is not acceptable for air handling units to be used with variable frequency drives.

Mount fans on isolation bases. Internally mount motors on same isolation bases and internally isolate fans and motors with 2-inch. Install flexible canvas ducts or vibration absorbent fan discharge seal between fan and casings to ensure complete isolation. Provide flexible canvas ducts that comply with NFPA 90A.

Weigh fan and motor assembly at air handling unit manufacturer's factory for isolator selection. Statically and dynamically balance fan section assemblies. Fan section assemblies include fan wheels, shafts, bearings, drives, belts, isolation bases and isolators. Allow isolators to free float when performing fan balance. Measure vibration at each fan shaft bearing in horizontal, vertical and axial directions.

Factory install all motors on slide bases to permit adjustment of belt tension.

Provide heavy duty, open drip-proof, operable at 460 volts, 60 hertz, 3-phase fan motors. Provide high efficiency motors. Refer to

specification Section 26 05 70.00 40 HIGH-VOLTAGE OVERCURRENT PROTECTIVE DEVICES and Section 26 05 71.00 40 LOW-VOLTAGE OVERCURRENT PROTECTIVE DEVICES.

Provide a marine-type, vapor proof service light in the fan segment. Provide 100 watt service light that is wired to an individual switch. Light requires 115 Volt, single phase, 60 Hertz service that is separate from the main power to the AHU. Provide a single 115 volt outlet at the light switch.

2.3 FAN

Provide an overall fan-section depth that is equal to or greater than the manufacturer's free-standing fan.

Locate fan inlet where it provides not less than one-half fan-wheel diameter clearance from cabinet wall or adjacent fan inlet where double wheels are permitted.

Install AHU fan motor and drive inside fan cabinet. Provide motor that conforms to NEMA MG 1 and is installed on an adjustable base. Provide an access door of adequate size for servicing motor and drive. Provide a belt guard inside the cabinet, or interlock the access door with the supply fan so that power to the fan is interrupted when the access door is opened.

2.4 DRAIN PANS

Provide intermediate-coil, 3-inch deep drip pans for each tiered coil bank.

Extend top pan 12 inches beyond face of coil, and extend bottom pan not less than 24 inches beyond face of coil. Where more than two pans are used, make pan extension proportional. Make adequate supports from the same type material as pans or hot-dip galvanized angle iron with isolation at interface. Provide pan material that is 22-gage AISI Type 304 corrosion-resistant steel with silver-soldered joints. Minimum size of drain opening is 1-1/4 inches. Pipe pan to drain.

Extend integral cabinet drain pan under all areas where condensate must be collected and make watertight with welded or brazed joints, piped to drain, corrosion protect in condensate collection area, and insulate against sweating. Provide minimum 14-gage sheet metal, except that 16-gage double-drain-pan construction is acceptable.

Provide cooling coil ends that are enclosed by cabinet and are factory insulated against sweating or drain to a drain pan.

Provide drain pans that are double pan construction, thermally isolated from the exterior casing with 1-inch thick fiberglass insulation. Provide drain pans that slope to drain and drain substantially dry by gravity alone when drains are open.

Provide pans that have a double slope to the drain point.

2.5 COILS

2.5.1 Coil Section

Provide coil section that encases cooling coils and drain pipes. Arrange coils for horizontal air flow. Provide intermediate drain pans for multiple coils installation. Completely enclose coil headers with the insulated casing with only connections extended through the cabinet.

2.5.2 Coil Pressure and Temperature Ratings

Provide coils that are designed for the following fluid operating pressures and temperatures:

<u>SERVICE</u>	<u>PRESSURE</u>	<u>TEMPERATURE</u>
Chilled Water	200 PSI	40 degrees F

Provide coils that are air-pressure tested under water at the following minimum pressures:

<u>SERVICE</u>	<u>PRESSURE</u>
Water (hot and chilled)	250 PSI

2.5.3 Coil Casings

Provide stainless steel casings. Provide cast iron, brass, or copper coil headers. Fit water coil headers with .25 inch ops spring-loaded plug drains and vent petcocks. Provide automatic air vents with ball type isolation valves for each coil piped to the drain pan.

Provide coils that are factory tested, dehydrated, vacuum tested, purged with inert gas, and sealed prior to shipment to the job site.

2.5.4 Chilled Water coils

Provide 0.625 inch outside diameter copper tubing for coils. Provide fins that are aluminum mechanically bonded by tubing expansion with a maximum spacing of 12 fins per 1 inch unless otherwise noted. Provide coils that have supply and return connections on the same end. Provide a maximum of four coil rows.

2.5.5 Drainable Coils

Provide drainable coils that are capable of being purged free of water with compressed air.

Provide self-draining coils that have a drain point at the end of every tube and are pitched to that point. Provide drain provisions that include: drained headers; U-bends with integral plugs; or nonferrous plugs in cast-iron headers. Provide tubes that drain substantially dry by gravity alone when drains and vents are open.

2.6 FILTERS

2.6.1 Filter Housing

Provide factory fabricated filter section of the same construction and finish as unit casings. Provide filter sections that have filter guides and full height, double wall, hinged and removable access doors for filter

removal. Provide air sealing gaskets to prevent air bypass around filters. Provide visible identification on media frames showing model number and airflow direction. Where filter bank is indicated or required, provide means of sealing to prevent bypass of unfiltered air. Performance in accordance with ASHRAE 52.1.

2.6.2 Replaceable Air Filters

UL 900, Class 1, those which, when cleaned, do not contribute fuel when attacked by flame and emit only negligible amount of smoke. Permanent frames with replaceable media, 1-inch thickness and size as indicated.

2.6.3 Disposable Cartridge Air Filters

UL 900, Class 2, UL classified, and factory assembled. Provide media of ultra-fine glass fibers having 50-55 percent average dust spot efficiencies with maximum final resistance 0.75 inch water gage and maximum face velocity of 500 feet per minute. Construct filter frame of 18 gage galvanized steel or aluminum with welded or riveted joints. Caulk or gasket entire assembly to prevent air leakage around frames. Ensure minimum efficiency of filter is 60 percent per ASHRAE 52.1

2.6.4 Air Filter Gauges

Provide manometer air filter gauges of the inclined tube differential type, of solid acrylic plastic construction with built-in level vial and with an adjustable mirror-polished scale. Equip gauges with vent valves for zeroing and over-pressure safety traps. Provide adequate gauge range for the particular installation. Provide gauges manufactured by Dwyer or approved equal.

Provide one (1) air filter gauge at each filter bank.

PART 3 EXECUTION

3.1 AHU EQUIPMENT INSTALLATION

Install equipment in accordance with manufacturer's recommendations.

Provide Installation drawings in accordance with referenced standards in this section.

Submit Listing of Product Installations for air handling units showing a minimum of 5 installed units, similar to those proposed for use, that have been in successful service for a minimum period of 5 years. Provide list that includes purchaser, address of installation, service organization, and date of installation.

3.2 ACCEPTANCE

Prior to final acceptance, use dial indicator gages to demonstrate that fan and motor are aligned as specified.

3.3 AHU TESTING

Perform air handling unit start-up in the presence of the Contracting Officer.

3.4 OPERATION AND MAINTENANCE

Submit Operation and Maintenance Manuals prior to testing the air handling units. Update and resubmit data for final approval no later than 30 calendar days prior to contract completion.

3.5 COORDINATION

Coordinate the size and location of concrete equipment pads, variable frequency drives, control and electrical requirements.

3.6 TEMPORARY CONSTRUCTION FILTERS

Have temporary construction filters in place during normal building construction whenever the air handling units are run for general ventilation, building dehumidification, and for other purposes during construction. Install two (2) layers of blanket filter at a time. Replace temporary construction filters as required during construction and after completion of duct system cleaning.

After systems have been cleaned and temporary construction filters are removed, and before test and balance operations are started, install set of final filters. Do not have final filters in place while general building construction is taking place, to avoid unnecessary loading with construction dust. Clean permanent filter bank before testing and balancing.

Submit all required installation, Fabrication and Connection drawings and obtain approval prior to the start of work detailed on these drawings.


Maximum number of coil rows is four (8). Maximum number of fins per inch is ten (12).

Provide VAV terminal units that are AHRI 880 certified and UL listed.

-- End of Section --

Indoor M-Series Climate Changer air handler

3/25/2009

Job Name	Stennis Riverine Training Facility	
User Name	(B29)Rob Hoffman	
Address	New Orleans	

Indoor M-Series Climate Changer air handler	AHU-1 (Cages)
Quantity	1
Job Comments	

Unit level selections		Module Position: 0	
Actual airflow	2000 cfm	Single or front discharge - 1 kHz	75 dB
Unit elevation	0.00 ft	Single or front discharge - 2 kHz	72 dB
Size criteria component	Largest 1/2" coil	Single or front discharge - 4 kHz	70 dB
Target face velocity	500 ft/min	Single or front discharge - 8 kHz	62 dB
Unit split	Factory splits	Inlet and casing - 63 Hz	79 dB
Unit size	06	Inlet and casing - 125 Hz	77 dB
Unit base	6" mounting leg	Inlet and casing - 250 Hz	72 dB
Inlet type	Ducted	Inlet and casing - 500 Hz	55 dB
Run acoustics	Yes	Inlet and casing - 1 kHz	58 dB
Largest 1/2" coil-max face vel	600 ft/min	Inlet and casing - 2 kHz	59 dB
Largest 1/2" coil-min face vel	250 ft/min	Inlet and casing - 4 kHz	54 dB
Largest 5/8" coil-max face vel	600 ft/min	Inlet and casing - 8 kHz	41 dB
Largest 5/8" coil-min face vel	250 ft/min	Casing - 63 Hz	77 dB
Face & bypass coil-max face velocity	600 ft/min	Casing - 125 Hz	75 dB
Face & bypass coil-min face velocity	250 ft/min	Casing - 250 Hz	71 dB
Flat filter - max face vel	625 ft/min	Casing - 500 Hz	54 dB
Flat filter - min face vel	0 ft/min	Casing - 1 kHz	57 dB
Angled filter - max face vel	625 ft/min	Casing - 2 kHz	53 dB
Angled filter - min face vel	0 ft/min	Casing - 4 kHz	44 dB
Bag/cartridge-max face vel	625 ft/min	Casing - 8 kHz	32 dB
Bag/cartridge-min face vel	0 ft/min	Ducted inlet - 63 Hz	74 dB
HEPA filter - max face vel	500 ft/min	Ducted inlet - 125 Hz	66 dB
HEPA filter - min face vel	0 ft/min	Ducted inlet - 250 Hz	60 dB
UL listed unit	UL listed	Ducted inlet - 500 Hz	46 dB
Single or front discharge - 63 Hz	88 dB	Ducted inlet - 1 kHz	48 dB
Single or front discharge - 125 Hz	83 dB	Ducted inlet - 2 kHz	50 dB
Single or front discharge - 250 Hz	82 dB	Ducted inlet - 4 kHz	45 dB
Single or front discharge - 500 Hz	75 dB	Ducted inlet - 8 kHz	32 dB

Unit control module		Module Position: 0	
Factory controls package	No factory mount	Controller type	No controller
Low limit interlock wiring	No	LCD screen & keypad	No LCD
Controller mounting	No mount	Design sequence	G
Automatic selection	No auto selection		

Coil performance data is certified in accordance with ARI standard 410. Propylene glycol and calcium chloride, or mixtures thereof, are not covered under the scope of ARI 410.

Air-handling performance data is certified in accordance with ARI standard 430. Air handlers with Q-fans, air handlers with plenum fans, and vertical draw-thru air handlers where the coil is mounted immediately below the fan module are not covered under the scope of ARI 430.

Indoor M-Series Climate Changer air handler

3/25/2009

Filter module

Module Position:

1

Module type	Filter	Design sequence	C
Filter type	Flat	Filter airflow	2000 cfm
Insulation	1.5 lb insulation	Filter condition	Mid-life
Panel wall type	Solid double wall	Mid-life prefilter PD	0.59 in H2O
Access/inspection door	Right	Prefilter PD	0.59 in H2O
Filter frame	2" & 4" comb	Filter area	5.60 sq ft
Prefilter type	Pleated media - MERV 8	Filter module PD	1.43 in H2O
Primary filter type	4" high eff - 85% eff - MERV 13	Mid-life filter PD	0.84 in H2O
Primary filter type - 2nd set	4" High eff - 85% eff - MERV 13		

Coil module

Module Position:

2

Coil mo [2]-1			
Module type	Vertical coil	Coil fouling factor	0.00000 hr-sq ft-deg F/Btu
Module size	Large	Fluid type	Water
Insulation	1.5 lb insulation	Max fluid PD	20.00 ft H2O
Panel wall type	Solid double wall	Location	Draw through
Drain pan	Stainless steel	Coil type	UW
Drain pan connection side	Right side	Coil rows	6
Coil application	Cooling	Coil fin type	Delta-Flo H
System type	Chilled water	Coil fin material	Aluminum
Coil supply side	Right	Tube diameter	1/2" tube (12.7 mm)
Coil casing	Galvanized	Coil tube material	.016" copper
Coil height	Unit	Corrosion resistant coating	None
Design sequence	H	Face velocity	342 ft/min
Apply ARI ranges	Yes	Air pressure drop	0.44 in H2O
Coil design airflow	2000 cfm	Leaving fluid temperature	54.00 F
Elevation	0.00 ft	Fluid pressure drop	3.05 ft H2O
EDB	87.10 F	Fluid volume	3.88 gal
EWB	73.90 F	Fluid velocity	2.48 ft/sec
LDB	54.60 F	Nominal height stacked coil #1	23" (584 mm)
LWB	54.46 F	Face area	5.86 sq ft
Sensible capacity	72.14 MBh	Dry coil weight	100.2 lb
Total capacity	130.74 MBh	Wet coil weight	132.6 lb
Fin spacing	119 Per Foot	Coil module PD	0.44 in H2O
Entering fluid temperature	44.00 F	Module length	28.750 in
Fluid temperature rise	10.00 F	Module weight	281.6 lb
Standard fluid flow rate	26.05 gpm		

Coil performance data is certified in accordance with ARI standard 410. Propylene glycol and calcium chloride, or mixtures thereof, are not covered under the scope of ARI 410.

Air-handling performance data is certified in accordance with ARI standard 430. Air handlers with Q-fans, air handlers with plenum fans, and vertical draw-thru air handlers where the coil is mounted immediately below the fan module are not covered under the scope of ARI 430.

All weights and dimensions are approximate. Certified prints on request.

Indoor M-Series Climate Changer air handler

3/25/2009

Fan module		Module Position:	3
Fan mod [3]-1			
Module type	Supply fan	Single or front discharge - 63 Hz	88 dB
Inlet location	Bottom inlet	Single or front discharge - 125 Hz	83 dB
Insulation	1.5 lb insulation	Single or front discharge - 250 Hz	82 dB
Panel wall type	Solid double wall	Single or front discharge - 500 Hz	75 dB
Access/inspection door	Right	Single or front discharge - 1 kHz	75 dB
Fan discharge	Top back	Single or front discharge - 2 kHz	72 dB
Drive location	Right	Single or front discharge - 4 kHz	70 dB
Design sequence	L	Single or front discharge - 8 kHz	62 dB
Motor hp	2 HP	Inlet and casing - 63 Hz	79 dB
Motor RPM	1800 RPM	Inlet and casing - 125 Hz	77 dB
Motor class	ODP EPACT high efficiency	Inlet and casing - 250 Hz	72 dB
Motor voltage	460/3	Inlet and casing - 500 Hz	55 dB
Cycle	60 cycles/sec	Inlet and casing - 1 kHz	58 dB
Drive service factor & type	1.5 fixed	Inlet and casing - 2 kHz	59 dB
Fan airflow	2000 cfm	Inlet and casing - 4 kHz	54 dB
ESP	0.60 in H2O	Inlet and casing - 8 kHz	41 dB
Elevation	0.00 ft	Ducted inlet - 63 Hz	74 dB
Min temperature	10.00 F	Ducted inlet - 125 Hz	66 dB
Design temperature	70.00 F	Ducted inlet - 250 Hz	60 dB
Max BHP	1.688 hp	Ducted inlet - 500 Hz	46 dB
Fan size and type	6B - 10.5" FC	Ducted inlet - 1 kHz	48 dB
Extended grease lines	w/ both bearings	Ducted inlet - 2 kHz	50 dB
BHP	1.497 hp	Ducted inlet - 4 kHz	45 dB
TSP	2.48 in H2O	Ducted inlet - 8 kHz	32 dB
Speed	1566 rpm	Casing - 63 Hz	77 dB
Outlet area	1.41 sq ft	Casing - 125 Hz	75 dB
Fan module PD	0.60 in H2O	Casing - 250 Hz	71 dB
Height	28.750 in	Casing - 500 Hz	54 dB
Length	41.000 in	Casing - 1 kHz	57 dB
Width	44.000 in	Casing - 2 kHz	53 dB
Weight	369.5 lb	Casing - 4 kHz	44 dB
Unit controller	No	Casing - 8 kHz	32 dB
Low limit interlock wiring	No LLT wired to starter,vfd		

Coil performance data is certified in accordance with ARI standard 410. Propylene glycol and calcium chloride, or mixtures thereof, are not covered under the scope of ARI 410.

Air-handling performance data is certified in accordance with ARI standard 430. Air handlers with Q-fans, air handlers with plenum fans, and vertical draw-thru air handlers where the coil is mounted immediately below the fan module are not covered under the scope of ARI 430.

All weights and dimensions are approximate. Certified prints on request.

Indoor M-Series Climate Changer air handler

3/25/2009

Job Name	Stennis Riverine Training Facility	
User Name	(B29)Rob Hoffman	
Address	New Orleans	

Indoor M-Series Climate Changer air handler	AHU-2 1st/2nd
Quantity	1
Job Comments	

Unit level selections		Module Position: 0	
Actual airflow	6000 cfm	Single or front discharge - 1 kHz	87 dB
Unit elevation	0.00 ft	Single or front discharge - 2 kHz	79 dB
Size criteria component	Largest 1/2" coil	Single or front discharge - 4 kHz	70 dB
Target face velocity	500 ft/min	Single or front discharge - 8 kHz	65 dB
Unit split	Factory splits	Inlet and casing - 63 Hz	92 dB
Unit size	12	Inlet and casing - 125 Hz	89 dB
Unit base	6" mounting leg	Inlet and casing - 250 Hz	81 dB
Inlet type	Ducted	Inlet and casing - 500 Hz	82 dB
Run acoustics	Yes	Inlet and casing - 1 kHz	74 dB
Largest 1/2" coil-max face vel	600 ft/min	Inlet and casing - 2 kHz	67 dB
Largest 1/2" coil-min face vel	250 ft/min	Inlet and casing - 4 kHz	59 dB
Largest 5/8" coil-max face vel	600 ft/min	Inlet and casing - 8 kHz	49 dB
Largest 5/8" coil-min face vel	250 ft/min	Casing - 63 Hz	82 dB
Face & bypass coil-max face velocity	600 ft/min	Casing - 125 Hz	84 dB
Face & bypass coil-min face velocity	250 ft/min	Casing - 250 Hz	73 dB
Flat filter - max face vel	625 ft/min	Casing - 500 Hz	73 dB
Flat filter - min face vel	0 ft/min	Casing - 1 kHz	62 dB
Angled filter - max face vel	625 ft/min	Casing - 2 kHz	56 dB
Angled filter - min face vel	0 ft/min	Casing - 4 kHz	50 dB
Bag/cartridge-max face vel	625 ft/min	Casing - 8 kHz	41 dB
Bag/cartridge-min face vel	0 ft/min	Ducted inlet - 63 Hz	92 dB
HEPA filter - max face vel	500 ft/min	Ducted inlet - 125 Hz	88 dB
HEPA filter - min face vel	0 ft/min	Ducted inlet - 250 Hz	81 dB
UL listed unit	UL listed	Ducted inlet - 500 Hz	81 dB
Single or front discharge - 63 Hz	96 dB	Ducted inlet - 1 kHz	73 dB
Single or front discharge - 125 Hz	95 dB	Ducted inlet - 2 kHz	67 dB
Single or front discharge - 250 Hz	94 dB	Ducted inlet - 4 kHz	58 dB
Single or front discharge - 500 Hz	90 dB	Ducted inlet - 8 kHz	48 dB

Unit control module		Module Position: 0	
Factory controls package	No factory mount	Controller type	No controller
Low limit interlock wiring	No	LCD screen & keypad	No LCD
Controller mounting	No mount	Design sequence	G
Automatic selection	No auto selection		

Coil performance data is certified in accordance with ARI standard 410. Propylene glycol and calcium chloride, or mixtures thereof, are not covered under the scope of ARI 410.

Air-handling performance data is certified in accordance with ARI standard 430. Air handlers with Q-fans, air handlers with plenum fans, and vertical draw-thru air handlers where the coil is mounted immediately below the fan module are not covered under the scope of ARI 430.

Indoor M-Series Climate Changer air handler

3/25/2009

Filter module

Module Position:

1

Module type	Filter	Design sequence	C
Filter type	Flat	Filter airflow	6000 cfm
Insulation	1.5 lb insulation	Filter condition	Mid-life
Panel wall type	Solid double wall	Mid-life prefilter PD	0.63 in H2O
Access/inspection door	Right	Prefilter PD	0.63 in H2O
Filter frame	2" & 4" comb	Filter area	13.30 sq ft
Prefilter type	Pleated media - MERV 8	Filter module PD	1.57 in H2O
Primary filter type	4" high eff - 85% eff - MERV 13	Mid-life filter PD	0.94 in H2O

Access/turning module

Module Position:

2

Module type	Access/blank	Door swing	Outward
Access/inspection/blank size	Medium	Front opening	Yes
Insulation	1.5 lb insulation	Back opening	Yes
Panel wall type	Solid double wall	Design sequence	D
Access/inspection door	Right	ASP	0.00 in H2O

Coil module

Module Position:

3

Coil mo [3]-1			
Module type	Horizontal coil	Coil fouling factor	0.00000 hr-sq ft-deg F/Btu
Module size	Medium	Fluid type	Water
Insulation	1.5 lb insulation	Max fluid PD	20.00 ft H2O
Panel wall type	Solid double wall	Location	Draw through
Drain pan	Stainless steel	Coil type	UW
Drain pan connection side	Right side	Coil rows	6
Coil application	Cooling	Coil fin type	Delta-Flo H
System type	Chilled water	Coil fin material	Aluminum
Coil supply side	Right	Tube diameter	1/2" tube (12.7 mm)
Coil casing	Galvanized	Coil tube material	.016" copper
Coil height	Unit	Corrosion resistant coating	None
Design sequence	H	Face velocity	488 ft/min
Apply ARI ranges	Yes	Air pressure drop	0.73 in H2O
Coil design airflow	6000 cfm	Leaving fluid temperature	54.00 F
Elevation	0.00 ft	Fluid pressure drop	8.84 ft H2O
EDB	83.60 F	Fluid volume	8.06 gal
EWB	69.40 F	Fluid velocity	4.03 ft/sec
LDB	54.20 F	Nominal height stacked coil #1	32" (813 mm)
LWB	53.87 F	Face area	12.30 sq ft
Sensible capacity	194.79 MBh	Dry coil weight	192.4 lb
Total capacity	294.52 MBh	Wet coil weight	259.8 lb
Fin spacing	116 Per Foot	Coil module PD	0.73 in H2O
Entering fluid temperature	44.00 F	Module length	15.500 in
Fluid temperature rise	10.00 F	Module weight	398.4 lb
Standard fluid flow rate	58.69 gpm		

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Air-handling performance data is certified in accordance with ARI standard 430. Air handlers with Q-fans, air handlers with plenum fans, and vertical draw-thru air handlers where the coil is mounted immediately below the fan module are not covered under the scope of ARI 430.

All weights and dimensions are approximate. Certified prints on request.

Indoor M-Series Climate Changer air handler

3/25/2009

Fan module

Module Position:

4

Fan mod [4]-1			
Module type	Supply fan	Low limit interlock wiring	No LLT wired to starter,vfd
Inlet location	Back inlet	Single or front discharge - 63 Hz	96 dB
Insulation	1.5 lb insulation	Single or front discharge - 125 Hz	95 dB
Panel wall type	Solid double wall	Single or front discharge - 250 Hz	94 dB
Access/inspection door	Right	Single or front discharge - 500 Hz	90 dB
Fan discharge	Top back	Single or front discharge - 1 kHz	87 dB
Drive location	Right	Single or front discharge - 2 kHz	79 dB
Fan wheel balance	Inverter balance	Single or front discharge - 4 kHz	70 dB
Design sequence	L	Single or front discharge - 8 kHz	65 dB
Motor hp	7.5 HP	Inlet and casing - 63 Hz	92 dB
Motor RPM	1800 RPM	Inlet and casing - 125 Hz	89 dB
Motor class	ODP EPACT high efficiency	Inlet and casing - 250 Hz	81 dB
Motor voltage	460/3	Inlet and casing - 500 Hz	82 dB
Cycle	60 cycles/sec	Inlet and casing - 1 kHz	74 dB
Drive service factor & type	1.5 fixed	Inlet and casing - 2 kHz	67 dB
Fan airflow	6000 cfm	Inlet and casing - 4 kHz	59 dB
ESP	2.00 in H2O	Inlet and casing - 8 kHz	49 dB
Elevation	0.00 ft	Ducted inlet - 63 Hz	92 dB
Min temperature	10.00 F	Ducted inlet - 125 Hz	88 dB
Design temperature	70.00 F	Ducted inlet - 250 Hz	81 dB
Max BHP	7.235 hp	Ducted inlet - 500 Hz	81 dB
Fan size and type	D12 - 18" AF	Ducted inlet - 1 kHz	73 dB
Extended grease lines	w/ both bearings	Ducted inlet - 2 kHz	67 dB
BHP	6.416 hp	Ducted inlet - 4 kHz	58 dB
TSP	4.30 in H2O	Ducted inlet - 8 kHz	48 dB
Speed	1996 rpm	Casing - 63 Hz	82 dB
Outlet area	2.86 sq ft	Casing - 125 Hz	84 dB
Fan module PD	2.00 in H2O	Casing - 250 Hz	73 dB
Height	39.000 in	Casing - 500 Hz	73 dB
Length	39.000 in	Casing - 1 kHz	62 dB
Width	64.000 in	Casing - 2 kHz	56 dB
Weight	669.0 lb	Casing - 4 kHz	50 dB
Unit controller	No	Casing - 8 kHz	41 dB

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All weights and dimensions are approximate. Certified prints on request.