Cooling Tower Data Sheet

H&H Industries Inc.
2801 Syene Road
Madison, WI 53713
USA
Phone: 608-273-3434 Fax: 608-273-9654
Project : Waupun Correctional- Food Service Renovation
Equipment Reference: CT-1 USS-14-86
Product Type : AT/UT/USS Cooling Tower

Nick Zwaska
FLUID HANDLING INC.
Madison Area Sales Office
Stoughton, WI 53589
USA
Phone: 608-209-2390

Date: 8/19/2013 Page: 1

Selection Criteria	
Capacity (Tons):	67.00
Capacity (MBH):	1,007.50
Fluid Type:	Water
Flow (GPM):	155.0
Entering Fluid Temp (°F):	98.0
Leaving Fluid Temp (°F):	85.0
Wet Bulb (°F):	78.2

IBC Design Criteria	
Seismic Design Force (g)	1g
Velocity Pressure (psf)	up to 60

CTI Certified Cooling Tower

Qty	Model	Capacity (Tons)	Percent Capacity
1	USS-14-86	72.61	108.1

All Weights, Dimensions and Technical Data are Shown per Unit

Fans:	1	Overall Length:	5' 11.875"
# Fan Motors @ HP:	(1) @ 5.00 (460/3/60)	Overall Width:	4' 0.500"
Air Flow (CFM)	18,000	Overall Height:	9' 6.500"
Inlet Pressure Drop (psi):	2.0		
Evaporated Water Rate (gpm):	1.61	Operating Weight (lbs)**:	2,230
** Adjusted for options selected below.		Shipping Weight (lbs):	1,410
		Heaviest Section (lbs):	970

Options Selected

Fan Motor: Inverter Capable, Premium Efficient
EVAPAK Fill
IBC Compliant up to 1g
Remote Sump Trash Screen
Oversized Outlet for Remote Sump; BFW/GRVD
304 Stainless Steel Cold Water Basin
304 Stainless Steel Upper
Ladder

Sound Data (Sound Pressure Levels in dB(A))

	End	Mtr Side	Opp End	Opp Mtr Side	Top
S.P.L. dB(A) at 5'	77	82	77	81	84
S.P.L. dB(A) at 50'	67	69	67	69	71

Note 1: Sound Data shown is for 1 Cell operating at full speed

Note 2: The use of frequency inverters (Variable Frequency Drives) can increase sound levels.

Note 3: Sound option(s) selected: None

Layout Criteria

Recommended Clearances Around Units (Feet)

From Unit Ends to Wall:	2.00	Between Unit Ends:	3.00
From Sides to Wall:	3.00	Between Unit Sides:	3.00

Refer to the Equipment Layout Manual or contact your Sales Representative for more details on layout criteria.

Shipping Data

Description		Domestic Skidded Dimensions (in)			Cubic Feet	Total Cubic Feet	Gross Wt (lbs)	Total Gross Wt (lbs)
Section		**Length**	**Width**	**Height**				
Basin	1	82	53	42	105	105	440	440
Casing	1	82	52	81	199	199	970	970
	2				304	304	1,410	1,410

Note:

SECTION 23 65 00

COOLING TOWERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes factory assembled and tested, open circuit mechanical induced-draft vertical discharge cooling tower.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, pressure drop, performance curves with selected points indicated, furnished specialties, and accessories.

B. Shop Drawings: Complete set of manufacturer's prints of evaporative equipment assemblies, control panels, sections and elevations, and unit isolation. Include the following:

1. Assembled unit dimensions.
2. Weight and load distribution.
3. Required clearances for maintenance and operation.
4. Sizes and locations of piping and wiring connections.
5. Wiring Diagrams: For power, signal, and control wiring. Differentiate between manufacturer installed and field installed wiring.

C. Operation and Maintenance Data: Each unit to include, operation, and maintenance manual.

1.4 QUALITY ASSURANCE

A. Verification of Performance:

1. Manufacturer shall have a thermal performance testing program for water cooling towers certified by the Cooling Technology Institute (CTI) in accordance with CTI Specification Standard STD-201. Manufacturer’s performance guarantees or performance bonds shall also be accepted.
2. Unit Sound Performance ratings shall be tested and certified according to CTI ATC-128 standard. Sound ratings shall not exceed specified ratings.

B. Unit shall meet or exceed energy efficiency per ASHRAE 90.1

1.5 WARRANTY

A. Submit a written warranty executed by the manufacturer, agreeing to repair or replace components of the unit that fail in materials and workmanship within the specified warranty period.

1. Fan Motor/Drive System: Warranty Period shall be Five (5) years from date of unit shipment from Factory (fan motor(s), fan(s), bearings, mechanical support, sheaves, bushings and belt (s))
2. The entire unit shall have a comprehensive five (5) year warranty against defects in materials and workmanship from date of shipment.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide cooling towers manufactured by one of the following:

1. EVAPCO Model USS-14-86

2. Approved Substitute

2.2 THERMAL PERFORMANCE

A. Each unit shall be capable to cool 155.00 GPM of water entering at 98.00ºF leaving at 85.00ºF at a design wet bulb of 78.20ºF.

2.3 IBC COMPLIANCE

A. The unit structure shall be designed, analyzed, and constructed in accordance with the latest edition of International Building Code (IBC) Regulations for seismic loads up to 1.0 g or wind loads up to 60 psf

2.4 COMPONENTS

A. Description: Factory assembled and tested, induced draft counter flow cooling tower complete with fan, fill, louvers, accessories and rigging supports

B. Materials of Construction

1. All cold water basin components including vertical supports, air inlet louver frames and panels up to rigging seam shall be constructed of Type 304 Stainless Steel.

2. Upper Casing, channels and angle supports shall be constructed of Type 304 Stainless Steel. Fan cowl and guard shall be constructed of Type 304 Stainless Steel."Series 300" Stainless Steel will not be acceptable as equivalent to Type 304 Stainless Steel.

C. Fan(s):

1. Fan(s) shall be high efficiency axial propeller type, using a high strength die cast aluminum hub and fiberglass reinforced polypropylene (PPG) wide chord blades. Each fan shall be statically balanced and installed in a closely fitted cowl with venturi air inlet for maximum fan efficiency.

D. Drift Eliminators

1. The eliminators shall be constructed entirely of Polyvinyl Chloride (PVC) in easily handled sections. Design shall incorporate three changes in air direction and limit the water carryover to a maximum of 0.001% of the recirculating water rate.

E. Water Distribution System

1. Spray nozzles shall be precision molded ABS, large orifice spray nozzles utilizing fluidic technology for superior water distribution over the fill media and to minimize water distribution system maintenance. Spray header and branches shall be Schedule 40 Polyvinyl Chloride (PVC) for corrosion resistance with steel connection to attach external piping. Branches shall have threaded end caps to facilitate debris removal.

F. Heat Transfer Media

1. Fill media shall be constructed of Polyvinyl Chloride (PVC) of cross-fluted design and suitable for inlet water temperatures up to 130 F. The bonded block fill shall be bottom supported and suitable as an internal working platform. Fill shall be self-extinguishing, have a flame spread of 5 under A.S.T.M. designation E-84-81a, and shall be resistant to rot, decay and biological attack.

G. Air Inlet Louvers

1. The air inlet louvers shall be constructed from UV inhibited polyvinyl chloride (PVC) and incorporate a framed interlocking design that allows for easy removal of louvers for access to the entire basin area for maintenance. The louvers shall have a minimum of two changes in air direction and shall be of a non-planar design to prevent splash-out, block direct sunlight and debris from entering the basin.

2.5 MOTORS AND DRIVES

A. General requirements for motors are specified in Division 23 Section “Motors”

B. Fan Motor

1. Fan motor(s) shall be totally enclosed, ball bearing type electric motor(s) suitable for moist air service. Motor(s) are Premium Efficient, Class F insulated, 1.15 service factor design. Inverter rated per NEMA MG1 Part 31.4.4.2 and suitable for variable torque applications and constant torque speed range with properly sized and adjusted variable frequency drives.

C. Fan Drive

1. The fan drive shall be multigroove, solid back V-belt type with taper lock bushings designed for 150% of the motor nameplate horsepower. The belt material shall be neoprene reinforced with polyester cord and specifically designed for evaporative equipment service. Fan sheave shall be aluminum alloy construction. Belt adjustment shall be accomplished from the exterior of the unit.

D. Fan Shaft

1. Shaft shall be Solid, ground and polished steel. Exposed surface coated with rust preventative.

E. Fan Shaft Bearings

1. Fan Shaft Bearings shall be heavy-duty, self-aligning ball type bearings with extended lubrication lines to grease fittings located on access door frame. Bearings shall be designed for a minimum L-10 life of 75,000 hours.

2.6 MAINTENANCE ACCESS

A. Fan Section

1. Circular access door shall be located in the upper casing for fan drive and water distribution system access. Swing away motor cover shall be hinged for motor access.

B. Basin Section

1. Framed removable louver panels shall be on two (2) sides of the unit for pan and sump access.

C. Ladder

1. An OSHA approved aluminum straight ladder shall be provided for access to the motor access door.

2.7 ACCESSORIES

A. Piping Connections

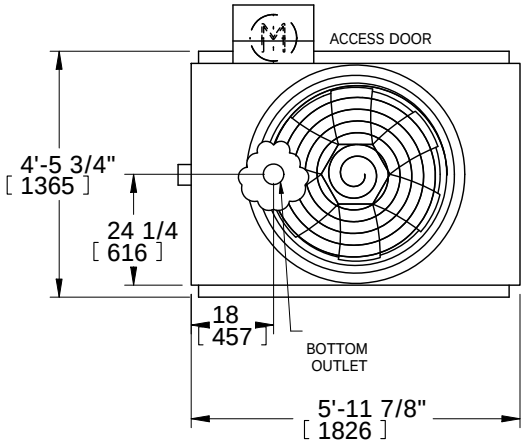
1. Unit shall be arranged for remote sump operation. Suction hood and strainer assembly as well as make up, overflow and drain connections shall be omitted.
2. Trash screen with anti vortexing baffle shall be provided for remote sump drain connection.

EVAPCO, INC.

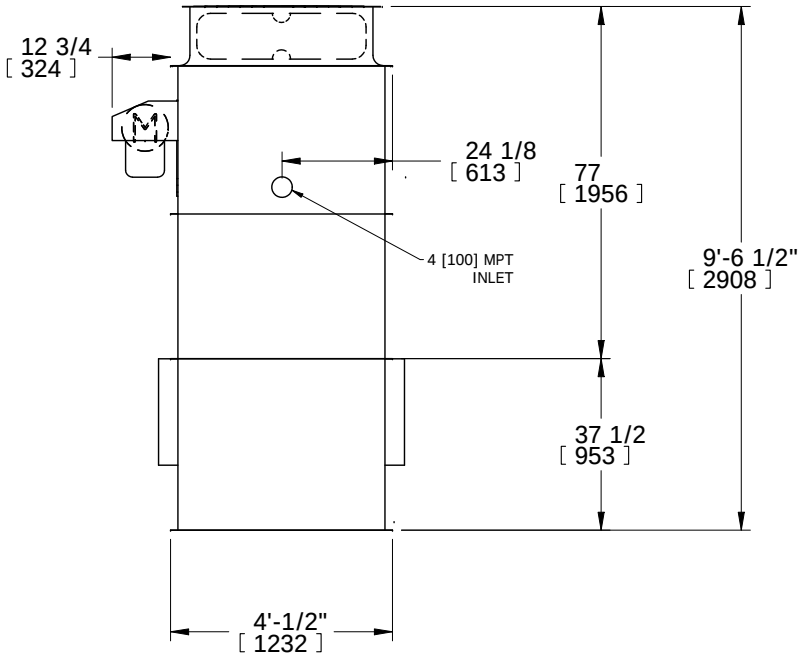
UNIT	MODEL #	SCALE	DWG. #	REV.	DATE	SERIAL #
COOLING TOWER	USS-14-86	N.T.S.	T3040624-DRI-RS	-	8/19/2013	

NOTES:
1. (M)- FAN MOTOR LOCATION
2. HEAVIEST SECTION IS UPPER SECTION
3. MPT DENOTES MALE PIPE THREAD
   FPT DENOTES FEMALE PIPE THREAD
   BFW DENOTES BEVELED FOR WELDING
   GVD DENOTES GROOVED
4. +UNIT WEIGHT DOES NOT INCLUDE
   ACCESSORIES (SEE ACCESSORY DRAWINGS)

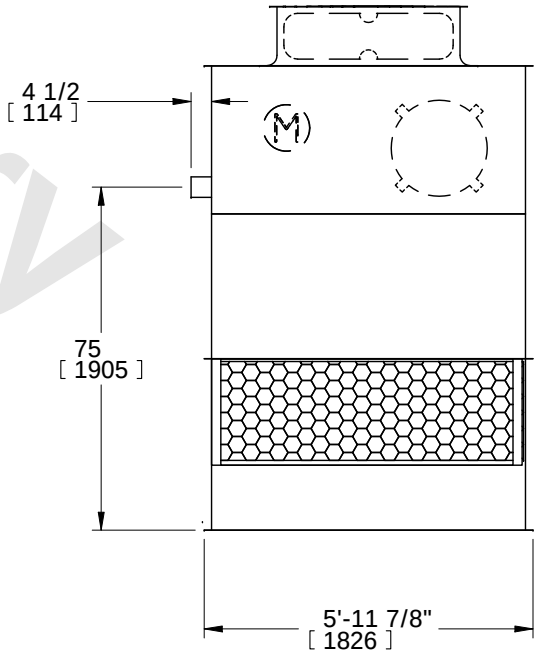
FACE 2
PLAN VIEW



FACE 1



FACE 2



FACE 1

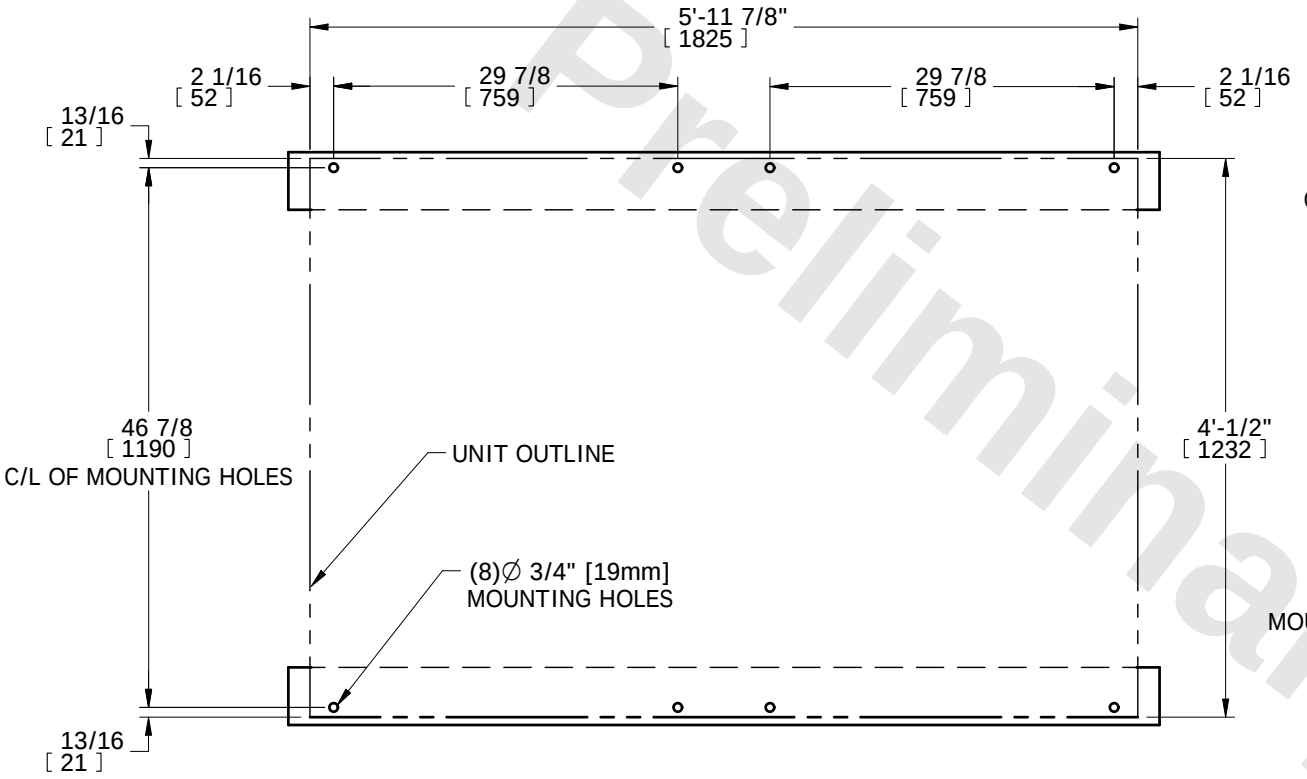
SHIPPING WEIGHT	OPERATING WEIGHT	HEAVIEST SECTION WEIGHT	NO. OF SHIPPING SECTIONS	DRAWN BY:
1410 lbs+ [640] kg+	2230 lbs+ [1012] kg+	970 lbs+ [440] kg+	2	KWC

USS-14-86

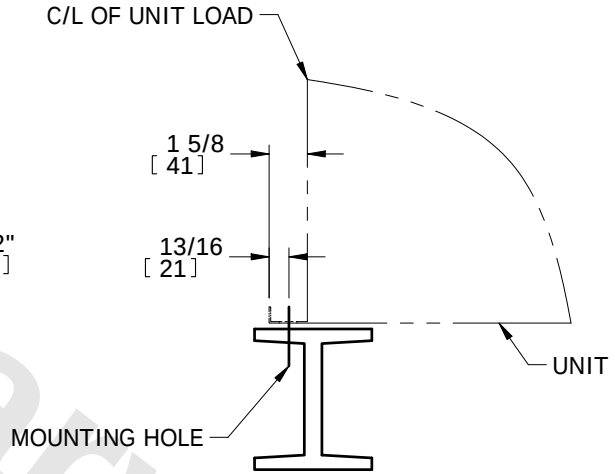
EVAPCO, INC.

8/19/2013

TITLE	UNIT:	DWG. #
STEEL SUPPORT CONFIGURATION	4x6 INDUCED DRAFT TOWER	SLT30406-DD



PLAN VIEW



TYPICAL END VIEW

NOTES:

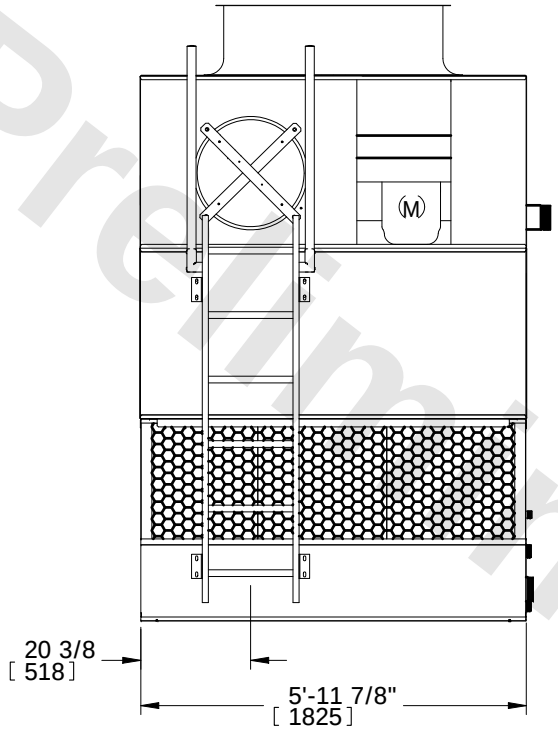
1. BEAMS SHOULD BE SIZED IN ACCORDANCE WITH ACCEPTED STRUCTURAL PRACTICES. MAXIMUM DEFLECTION OF BEAM UNDER UNIT TO BE 1/360 OF UNIT LENGTH NOT TO EXCEED 1/2" [13mm].
2. DEFLECTION MAY BE CALCULATED BY USING 55% OF THE OPERATING WEIGHT AS A UNIFORM LOAD ON EACH BEAM. SEE CERTIFIED PRINT FOR OPERATING WEIGHT.
3. SUPPORT BEAMS AND ANCHOR HARDWARE ARE TO BE FURNISHED BY OTHERS. ANCHOR HARDWARE TO BE ASTM - A325 5/8" [16mm] BOLT OR EQUIVALENT.
4. BEAMS MUST BE LOCATED UNDER THE FULL LENGTH OF THE PAN SECTION.
5. SUPPORTING BEAM SURFACE MUST BE LEVEL. DO NOT LEVEL THE UNIT BY PLACING SHIMS BETWEEN THE UNIT MOUNTING FLANGE AND THE SUPPORTING BEAM.
6. ANCHORING ARRANGEMENT SHOWN HAS A MAXIMUM WIND RATING OF 60 PSF [2.87 KPa] ON CASED VERTICAL SURFACES.
7. THE FACTORY RECOMMENDED STEEL SUPPORT CONFIGURATION IS SHOWN. CONSULT THE FACTORY FOR ALTERNATE SUPPORT CONFIGURATIONS.
8. UNIT SHOULD BE POSITIONED ON STEEL SUCH THAT THE ANCHORING HARDWARE FULLY PENETRATES THE BEAM'S FLANGE AND CLEARS THE BEAM'S WEB.

EVAPCO, INC.

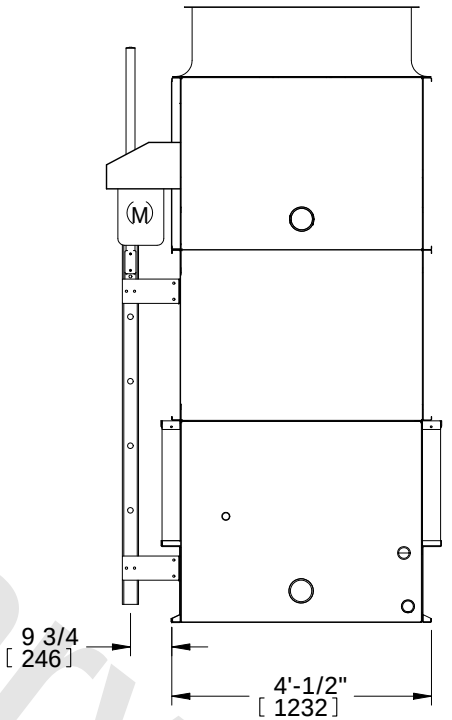
USS-14-86

8/19/2013

TITLE	UNIT:	DWG. #
VERTICAL LADDER INSTALLATION PACKAGE	4X6 INDUCED DRAFT TOWER	LDT30406-DC



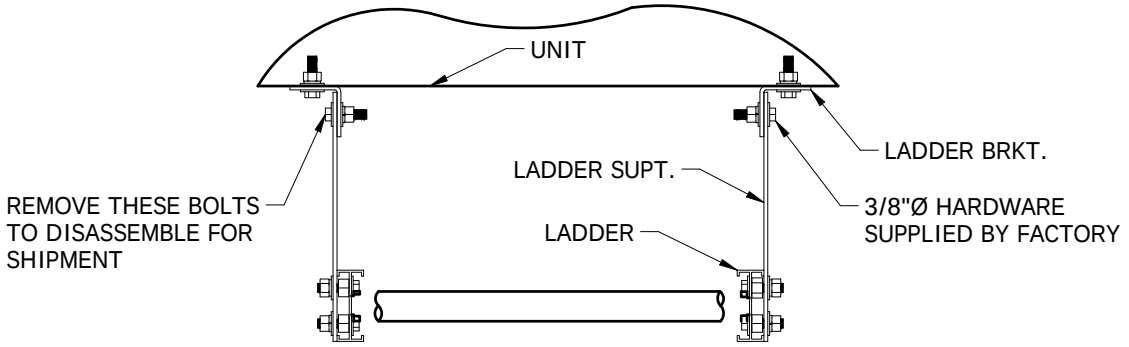
SIDE VIEW



END VIEW

* THE BOTTOM OF THE LADDER IS AT THE BASE OF THE UNIT. IF THE UNIT IS ELEVATED THEN A LADDER EXTENSION SHOULD BE CONSIDERED. (CONSULT FACTORY) LADDER EXTENSIONS OF UP TO 3 FEET CAN BE ADDED WITHOUT ANY ADDITIONAL SUPPORT. FOR A LADDER EXTENSION LONGER THAN 3 FEET ADDITIONAL SUPPORT MUST BE PROVIDED BY OTHERS.

NOTES:
1. THE VERTICAL LADDER IS AN INDUSTRIAL GRADE.
2. THE LADDER SHIPS LOOSE FOR FEILD INSTALLATION BY OTHERS.
3. SEE MOUNTING ARRANGEMENT DETAILS AS SHOWN.
4. THE LADDER AND DESIGNS FALL UNDER OSHA REQUIREMENTS.



Sound Pressure Levels (SPL) in dB RE 0.0002 Microbar
Sound Power Levels (PWL) in dB RE 10-12 Watt

MODEL USS-14-86
MOTOR 5.00 HP
MOTORS 1
SPEED: Full Speed

1 **CELL DATA**

	SOUND PRESSURE LEVEL (dB)										
	End		Motor Side		Opp End		Opp Mtr. Side		Top		SOUND
	5 ft	50 ft	5 ft	50 ft	5 ft	50 ft	5 ft	50 ft	5 ft	50 ft	POWER
BAND	(1.5m)	(15m)	(1.5m)	(15m)	(1.5m)	(15m)	(1.5m)	(15m)	(1.5m)	(15m)	LEVEL (dB)
63 HZ	83	73	85	74	83	73	85	74	81	73	105
125 HZ	84	77	87	78	84	77	86	78	90	79	110
250 HZ	79	70	81	71	79	70	80	71	84	73	103
500 HZ	76	64	81	65	76	64	80	65	84	70	98
1 KHZ	70	60	76	62	70	60	76	62	78	63	94
2 KHZ	66	57	71	58	66	57	71	58	73	60	90
4 KHZ	61	53	69	55	61	53	69	55	68	59	88
8 KHZ	56	46	68	50	56	46	68	50	61	51	81
CALC dBA	77	67	82	69	77	67	81	69	84	71	101

Sound option(s) selected: None

EVAPCO USS-14-86 PERFORMANCE CURVE