evapco® for LIFE

eco-ATWB-E

The Best Family of Closed Circuit Coolers to maximize water and energy savings

Eurovent-CTI CERTIFIED

Ellipti-*fin*® *coil*

CROSSCOOL™ Technology

Environmentally Conscious Operation Featuring Water & Energy Conserving Technology

ENVIRONMENTAL SOLUTIONS... CREATING A BETTER WORLD!

CERTIFIED EN ISO 9001

IBC COMPLIANT DESIGNS

EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com

CTI CERTIFIED Mark owned by the Cooling Technology Institute

CE PRESSURE EQUIPMENT DIRECTIVE 97/23/EC ASSESSED BY NOTIFIED BODY

EAC

eco-ATWB-E

Since its founding in 1976, EVAPCO, Inc. has become a world-wide leader in supplying quality cooling equipment for thousands of customers in both the commercial and industrial markets.

EVAPCO's success has been the result of a continual commitment to product improvement, quality workmanship and a dedication to providing unparalleled service.

Our emphasis on research and development has led to many product innovations – a hallmark of EVAPCO through the years.

The ongoing R & D Program enables EVAPCO to provide the most advanced products in the industry – technology for the future, available today.

EVAPCO products are manufactured on five continents around the world and distributed through hundreds of factory authorized sales representatives.

Design and Construction Features

The new eco-ATWB-E line of Closed Circuit Coolers offers the same great design benefits and features as the eco-ATW but it has also been specifically designed to optimize both the evaporative (latent) and dry (sensible) modes of cooling simultaneously. This unique design joins an evaporative cooler and a dry cooler into one unit. The eco-ATWB-E utilizes the EVAPCO **Ellipti-*fin*** coil which features elliptical spiral fin technology to maximize the surface area available for heat transfer. This decreases water consumption and offers additional cost savings through reduced water make-up, blow-down, and chemical consumption Evaporative cooling pro-vides lower system operating temperatures and higher overall system efficiencies. The eco-ATWB-E is the ideal solution for: Reducing Water Consumption, Lower Energy Costs, High Dry Bulb Switchover, Super Low Sound Levels. **This new product is designed with IBC Compliant construction and Eurovent-CTI Certified.**

Easy to Service Motor Mount Design

- **All normal maintenance can be performed quickly from outside the unit**
- Designed for easy belt adjustment
- Extended lube lines for easy bearing lubrication
- If required, motor may swing to outside for easy removal

Water Saver Drift Eliminators

- New patented design reduces drift rate to < 0.001%
- Saves water and reduces water treatment cost
- Greater structural integrity vs. old style blade-type
- Recessed into casing for greater protection

PVC Spray Distribution Header with ZM II™ Nozzles

- Large orifice nozzles prevent clogging (no moving parts)
- Nozzles are threaded into header at proper orientation
- Fixed position nozzles require zero maintenance
- Guaranteed for life

"Clean Pan" Basin Design

- Access from all four sides
- Large open area simplifies maintenance
- Basin may be inspected with pumps running
- Sloped basin design prevents sediment buildup, biological film and standing water

The Sage³® Water and Energy Conservation Control System

The only way to properly control and operate the eco-ATWB-E Closed Circuit Cooler is to provide as standard, the ***Sage³®*** Water and Energy Conservation Control System. The ***Sage³®*** is designed to optimally control the fan motor(s) and the pump motors of the unit. The ***Sage³®*** will efficiently reject the building load using the minimal amount of water and energy.

- Sophisticated control system that measures & analyses water inlet & out-let temperatures and the ambient dry bulb to minimize water consumption
- Variable frequency drive controls for fan motor(s)
- Maximizes water and energy savings

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Advanced Design Smooth Flow Fans

- Totally Enclosed Fan Motors assures long life
- Power-Band Belts for Better Lateral Rigidity
- Advanced Design Aluminum Fan Blades
- Non-corroding Cast Aluminum Sheaves
- Heavy-Duty Fan Shaft Bearings with L-10 life of 75,000 - 135,000 hrs
- All Other Components Corrosion Resistant Materials

† EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com — CTI CERTIFIED

Eurovent-CTI Certified
Refer to page 25

Low Sound Options available
Refer to page 17

Super Low Sound Fan (optional)

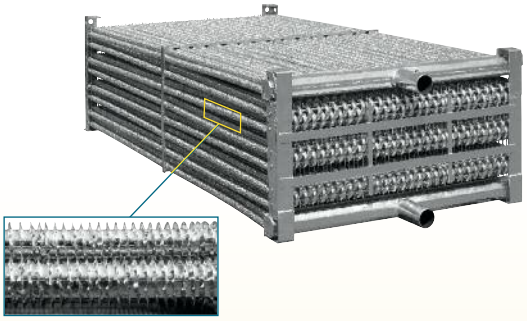
- Extremely wide sloped fan blades for sound sensitive applications
- One piece molded heavy duty construction
- 9-15 dB(A) sound reduction

Ellipti-*fin*® *Coil*

Featuring Elliptical Spiral Fin Coil Technology

Introducing the Most Efficient Closed Circuit Cooler Coil in th HVAC industry! The Ellipti-*fin*® provides:

- All coil rows feature patent pending finned Thermal-Pak® elliptical tube design
- Lower airflow resistance than typical finned round tubes
- Increased Evaporative and Dry Cooling efficiency
- Features EVAPCO's exclusive ***CROSS***COOL™ tube enhancement for greater internal heat transfer.



IBC Compliant Design
Refer to page 23

Louver Access Door

- Hinged access panel with quick release mechanism
- Allows easy access to perform routine maintenance and inspection of the makeup assembly, strainer screen and basin
- Available on larger models

Easy Field Assembly

- A new field assembly seam design which ensures easier assembly and reduced potential for field seam leaks
- Self-guided channels guide the fan casing section into position improving the quality of the field seam
- Eliminates up to 66% of fasteners *(Patent Pending)*

Partition Panel

A water tight partition spans from the fan section of the unit down to the basin. This partition separates the two coils and ensures water does not contact the dry coil when the unit is operating in the water efficient mode.

Multiple Water Distribution Systems

Each coil in this unit fatures its own water distribution system. This allows each coil to operate in a mode independent of the other coil.

WST Air Inlet Louvers (Water and Sight Tight)

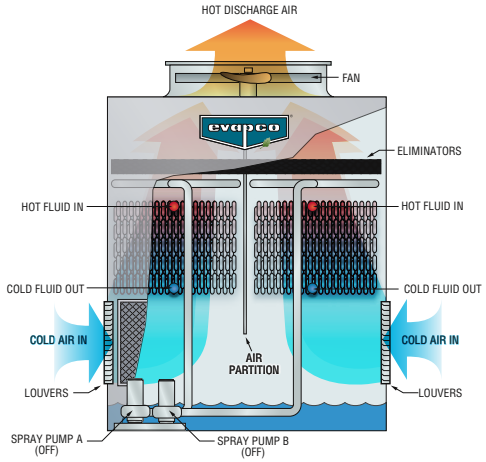
- Easily removable for access
- Improved design to keep sunlight out–preventing biological growth
- Keeps water in while keeping dirt and debris out (U.S. Patent No. 7927196)

† Mark owned by the Cooling Technology Institute

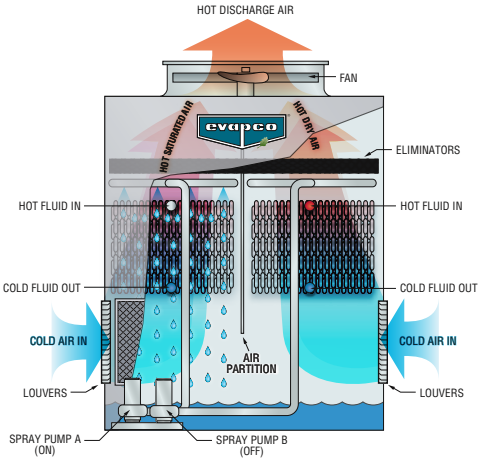
eco-ATWB-E

DESIGN FEATURES

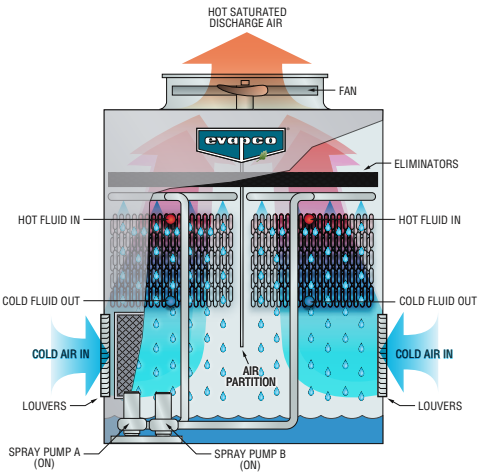
DRY MODE



WATER EFFICIENT MODE



WET MODE



Principle of Operation

Dry Mode

(Sensible Heat Transfer)

In the dry mode, the recirculating spray pumps are turned off (Fan on, Pump A & B off). The process fluid enters the eco-ATWB-E cooler through the top coil connection and circulates through the coil with the Fan On. Heat from the process fluid is dissipated to the atmosphere by sensible heat transfer through the tube walls to the air passing over the coils. The coils are finned to promote optimal airflow over the coil and to maximize heat transfer area. Air is drawn over the finned coils by the fan drive system. The process fluid is then returned to the heat source via the bottom coil connection. This mode of operation eliminates water consumption when the dry bulb temperature is favorable.

Water Efficient Mode

(Evaporative and Sensible Heat Transfer)

The joint wet and dry operation mode provides water savings as well as low approach temperatures. In this joint mode of operation, the fan is on and the process fluid enters the coils through the top coil connections (Fan on, Pump A on, Pump B off). Recirculating pump B is turned off and coil B rejects a portion of the heat load to the atmosphere through the tube and fin walls to the air passing over the coils using sensible heat transfer. Pump A is left on where heat from the process fluid is transferred through the coil tubes to the water cascading downward over coil A. This mode of operation minimizes the amount of water used while maintaining the cooling capacity required. The cooled fluid then returns to the process via the bottom coil connection.

Evaporative Mode

(Latent Heat Transfer)

In the evaporative mode, the process fluid enters the cooler through the top coil connections and circulates through the finned coils. With both pumps on, the heat from the process fluid is transferred through the coil tubes to the water cascading downward over the coils while simultaneously air is drawn upward over the coil opposite the water flow using the fan drive system (Fan on, Pump A & B on). A small portion of the water is evaporated to dissipate the heat to the atmosphere in a latent heat transfer. This mode of operation provides fan energy savings and lower leaving water temperatures by utilizing evaporative cooling.

DESIGN FEATURES

eco-ATWB-E

eco-ATWB-E Operating Benefits

The eco-ATWB-E maintains all of the advantages of the eco-ATW with the additional benefit of enabling simultaneous wet and dry operation. The unique ***Water Efficient Mode*** of the eco-ATWB-E allows for a portion of the heat load to be rejected through both evaporative cooling AND dry cooling, even at high ambient temperatures, this further increases your ability to save water and offers additional associated cost savings through reduced water make-up, blow-down and chemical consumption. The eco-ATWB-E provides an ideal solution for applications where minimizing both energy and water consumption is critical.

Depending on the optimum eco-Cooler you select for your job, one can operate 100% wet, 100% dry or simultaneously Wet & Dry in the ***Water Efficient Mode***, offering unique advantages in freezing climates, higher temperature industrial cooling applications where 100% evaporative cooling is not always favorable.

eco-ATWB-E Operational Savings example:

Consider an industrial application in Munich (Germany), where the unit is required to reject a constant heat load of 740 kW with 30 l/s of water entering at a temperature of 32°C and a leaving temperature of 26°C. The process operates 24 hours a day 7 days a week. The eco-ATWB-E is compared to:

- **ESWA 96-33J-2** – an evaporative cooler without dry cooling capability
- **ATW 120-4K-2** – an induced draft counter-flow cooler capable of some dry operation

Model Attribute Comparison

	eco-ATWB-E 10-5I12-Z	ATW 120-4K-2	ESWA 96-33I-2
Fan Motor (kW)	7,5	15	7,5
Pump Motor (kW)	(2) 1.5	4	5,5
Box size (m x m)	3.0 x 3.6	3.0 x 3.6	2.4 x 3.6
Weight (kg)	13130	10120	6665

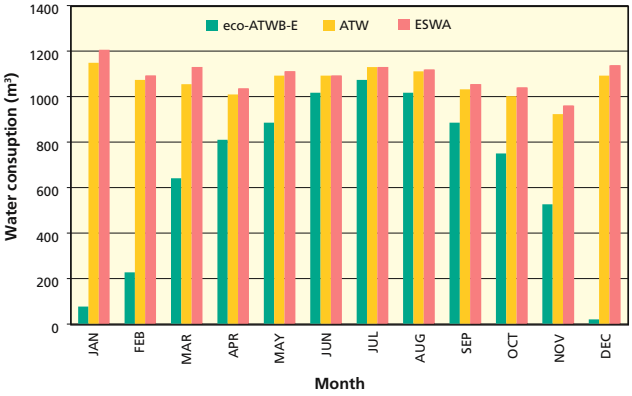
Generally the eco-coolers eco-ATWB-E require lower total installed kW than ATW and ESWA with consequent energy savings.

Dry Mode of Operation Comparison

	eco-ATWB-E 10-5I12-Z	ATW 120-4K-2	ESWA 96-33I-2
% dry operation hours	18,9	4	0
% hybrid operation hours	62,9	0	0
% wet hours	18,2	96	100

With the increased dry cooling efficiency of the eco-ATWB-E and the use of the *Sage3*® Water and Energy Conservation Control System, the eco-ATWB-E is able to operate dry or hybrid mode for more than 80% of the year:

eco-ATWB-E vs ATW and ESWA



With very interesting savings associated with water usage.

Annual Water Cost Comparison

	eco-ATWB-E 10-5I12-Z	ATW 120-4K-2	ESWA 96-33I-2
Total Annual Water Usage (m^3) *	7951	12807	13155
Annual m^3 Water Savings eco-ATWB-E vs. ATW / ESWA (%)	-	38,0%	39,6%
Annual Water Savings eco-ATWB-E vs. ATW / ESWA (€) **	-	17000, €	18300, €

* Based on 3 cycles of concentration
** 3.5 € / m^3 (water-treatment-sewer)

eco-ATWB-E

SAGE System

EVAPCO's *Sage* ... Water and Energy

The EVAPCO eco-ATWB-E closed circuit coolers utilize the ***Sage3***™ water and energy conservation control system which controls Dry & Evaporative modes of operation. The control system operates by measuring and analyzing water inlet and outlet temperature simultaneous with ambient dry bulb monitoring in order to minimize the evaporative cooling mode of operation and to save system water. The ***Sage3***™ can also be programmed to operate with a water savings or energy savings priority. ***Sage3***™ **is supplied as standard with eco-ATWB-E**.

The Sage Controller features a IP65 enclosure with CE approval. The panel also includes a 10" touch screen operator interface with color display and a Modbus 485* data port for communication with the building automation system. **The data points are: Inlet Temperature, Outlet Temperature, Dry Bulb Temperature, Basin Water Temperature Sensor, Fan Run Time, Pump Run Time, VFD Speed, Fan Motor Status – On/Off, Fan RPM, Pump Status – On/Off.**

Standard Control Items

- A MODBUS 485* Port for the Building Automation System
- Programmable Logic Control
- Fluid Inlet Temperature Sensor(s)
- Fluid Outlet Temperature Sensor(s)
- Basin Temperature Sensor(s)
- Ambient Dry Bulb Sensor(s)
- Variable frequency drive(s) For Fan Motor(s)
- Recirculating Pump Motor Starter(s).
- Main Disconnect
- Manual Bypass
- DC power supply for the PLC and instrumentation.
- Heater Package Controls w/ Contactor with Overload Protection
- Control Power Transformer
- 3-Probe Electronic Water Level Control Package
- High Water Level Alarm Contact(s)
- Low Water Level Alarm Contact(s)
- Fan Motor: Space Heater Control(s)

Control for Optional Accessories

- Discharge Hood Damper Controls
- Vibration Switch Controls

SAGE SYSTEM

eco-ATWB-E

Conservation Control System

HMI Panel Display

Sage® Control Panel is provided with a 10" touch screen operator interface with a color display.
This allows for easy viewing and control at the panel.

Easy-to-use Touch Screen Navigation

The panel boasts an easy to navigate menu which will allow the user to control each cell independently from other units and gather useful run time information at the unit.

Alarm Setpoints Screen

Plan View Screen

End View Screen

Window Enclosure

The display screen is encased by a window enclosure.
This enclosure protects the HMI display from the elements.

Electric Water Level Control Package

When a Sage Panel is provided, a 3-probe Electronic Water Level Controller is standard. In addition to controlling the make-up valve, this controller contains one probe that can be utilized as low water cut off for the spray pump and also be used as a safety device, shutting off the pump if the water level becomes too low. High/Low water level alarm probes are std, too.

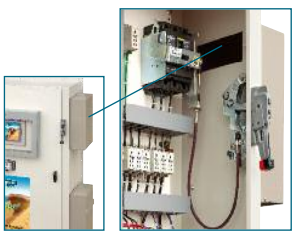
Temperature Sensors

Four separate temperature data points are monitored with this package.

- Inlet Water Temperature Sensor
- Outlet Water Temperature Sensor
- Dry Bulb External Air Temperature Sensor
- Water Basin Temperature Sensor

Enclosure Temperature Control

The panel enclosure includes an intake and an exhaust ventilation fan. When the enclosure temperature rises to a predetermined set point, the exhaust fans are activated. The enclosure also contains a heater. The heater eliminates the drastic temperature changes which could create condensation inside of the enclosure.



Fan

Heater

Optional Data Ports May Be Available.
Please Contact Your Local Sales Representative.

eco-ATWB-E

DESIGN FEATURES

EVAPCOAT Corrosion Protection System

EVAPCO, long known for using premium materials of construction, has developed the ultimate system for corrosion protection in galvanized steel construction – the EVAPCOAT Corrosion Protection System. Marrying corrosion free materials with heavy gauge mill hot-dip galvanized steel construction to provide the longest life product with the best value.

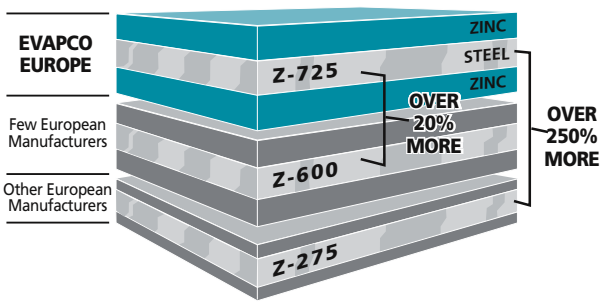
The Evapcoat Corrosion Protection System consist of:

• Z-725 Mill Hot-Dip Galvanized Steel Construction

Mill hot-dip galvanized steel has been successfully used for over 25 years for the protection of evaporative coolers against corrosion. There are various grades of mill galvanized steel each with differing amounts of zinc protection. EVAPCO has been a leader in the industry in developing heavier galvanizing, and was the first to standardize on Z-600 mill hot-dip galvanized steel. Now, EVAPCO is, once again, increasing the level of corrosion protection by being the first and only manufacturer in Europe to use Z-725 mill hot-dip galvanized steel.

Z-725 designation means there is a minimum of 725 g of zinc per m^2 of surface area present on the steel. Z-725 is the heaviest level of galvanizing available for manufacturing evaporative coolers and has over 2.5 times more zinc protection than competitive designs using Z-275 steel. With Z-725 mill hot-dip galvanized steel construction, EVAPCO provides galvanized steel panels with corrosion protection that approaches the level of the hot-dip galvanized heat exchanger coils.

During fabrication, all panel edges are coated with a 95% pure zinc-rich compound for extended corrosion resistance.



• Type 304 Stainless Steel Strainers

Subjected to excessive wear and corrosion, the sump strainer is critical to the successful operation of the cooler. EVAPCO uses only stainless steel for this very important component.

• PVC Air Inlet Louvers

The innovative design uses corrosion free materials while effectively eliminating splash out and reducing the potential for algae formation inside the cooler.

• PVC Drift Eliminators

The final elements in the upper part of the cooler are moisture eliminators which strip the entrained water droplets from the leaving air stream.

EVAPCO eliminators are constructed entirely of inert, corrosion-free PVC. This PVC material has been specially treated to resist damaging ultraviolet light. The eliminators are assembled in easily handled sections to facilitate removal thereby exposing the upper portion of the unit and water distribution system for periodic inspection.

• PVC Water Distribution System, ZM Spray Nozzle

The fixed position ZM Spray Nozzles are mounted in corrosion-free PVC water distribution pipes. Together, these elements combine to provide unequaled coil coverage, scale prevention and make the industries best performing non-corrosive, maintenance-free water distribution system.

• Totally Enclosed Motors

EVAPCO uses totally enclosed motors for all fan and pump motors as standard. These superior motors help to assure longer equipment life without motor failures, which result in costly downtime.

• Alternate Materials of Construction

EVAPCO induced draft coolers have a modular design which allows for specific areas to be enhanced for increased corrosion protection. For particularly corrosive environments, EVAPCO coolers are available with Stainless Steel construction for the basin and/or casing.

• Stainless Steel Welded Basin

The basin area of a cooler is often subjected to high concentrations of impurities and silt. In addition to the EVAPCOAT Corrosion Protection System, EVAPCO offers optional stainless steel construction for superior corrosion resistance. This option provides Type 304 or Type 316 stainless steel for the entire basin section - including the support columns and air inlet louver frames.

NOTE: Closed Circuit Coolers should only be used on sealed, pressurized systems. Continual aeration of the water in an open system can cause corrosion inside the tubes of the cooler leading to premature failure.

DESIGN FEATURES

eco-ATWB-E

Belt Drive Units - 2.3 m, & 2.4 m Wide Models

eco-ATWB-E 9-3G8 to eco-ATWB-E 8-6K21

The fan motor and drive assembly on these units are designed to allow easy servicing of the motor and adjustment of the belt tension from the exterior of the unit. The T.E.F.C. fan motor is mounted on the outside of these models.

External Motor Mount (with optional ladder)

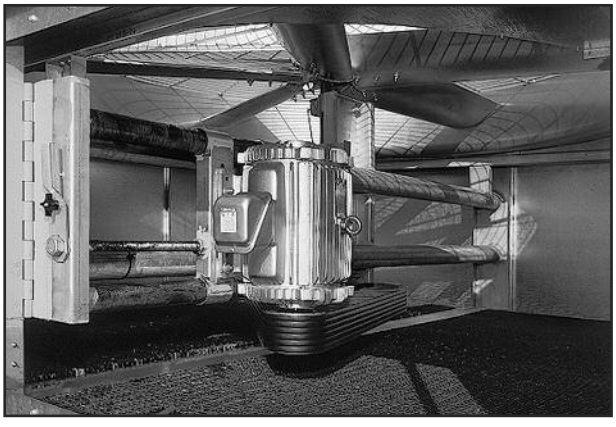
A large hinged access door with a "quick release" latch provide access to the fan section for maintenance.

NOTE: the sloped access ladder is available on all eco-ATWB-E models. Please check conformity with local legislation before application.

Belt Drive Units - 3 m & 3.6 m Wide Models

eco-ATWB-E 10-3I-12 to eco-ATWB-E 12-6P-20

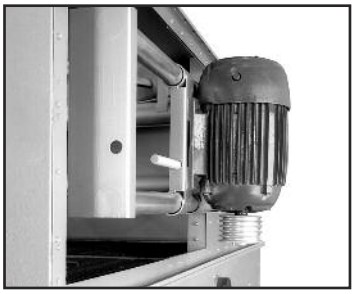
Designed as the ideal replacement cooler, these models provide both cost effective and energy efficient alternatives to obsolete centrifugal fan designs. The 3 m wide plan areas are also well suited for new installations and provide more layout flexibility. The unique belt drive design features are detailed below.



Motor Base Assembly

The fan motor and drive assembly is designed to allow easy servicing of the motor and adjustment of the belt tension from the exterior of the unit. The T.E.A.O. fan motor is located inside the fan casing on a rugged heavy duty motor base. The innovative motor base also features a unique locking mechanism for a positive adjustment.

The motor base is designed to swing out through a very large 1.3 m^2 access opening. This allows for easy servicing of the motor.



Motor Access

Power- Band Drive Belt: The Power-Band is a solid-back, multigroove belt system that has high lateral rigidity. The belt is constructed of neoprene with polyester cords. The drive belt is designed for 150 percent of the motor nameplate kW for long life and durability.

Fan Shaft Bearings: The fan shaft bearings in eco-ATWB-E units are specially selected for long, trouble-free life. They are rated for an L-10 life of 75.000 to 135.000 hours and are the heaviest pillow block bearings available.

Aluminum Alloy Pulleys: Fan pulleys are constructed of corrosion free aluminum for long life. The aluminum also helps belts last longer.

eco-ATWB-E

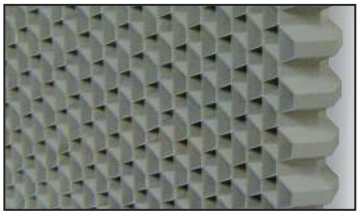
DESIGN FEATURES

Water Management
High Efficient Water Saver Drift Eliminators

An extremely efficient drift eliminator system is standard on EVAPCO coolers. The patented system removes entrained water droplets from the air stream to limit the drift rate to less than 0.001% of the recirculating water rate. With a low drift rate, EVAPCO coolers save valuable water and water treatment chemicals. The drift eliminators are constructed of an inert polyvinyl chloride (PVC) plastic material which effectively eliminates corrosion of these vital components. They are assembled in sections to facilitate easy removal for inspection of the water distribution system.

Superior WST Air Inlet Louver and Screen Design

EVAPCO's patented WST Inlet Louvers keep water in and sunlight out of the basins of induced draft products. The unique non-planar design is made from light-weight PVC sections which easily fit together and have no loose hardware, enabling easy basin access.



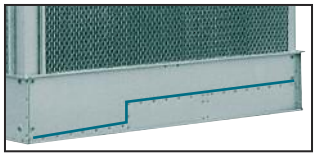
Inlet Louver Material

Developed with computational fluid dynamics (CFD) software, the louver's air channels are optimized to maintain fluid dynamic and thermodynamic efficiency and block all line-of-sight paths into the basin eliminating splash-out; even when the fans are off. Additionally, algae growth is minimized by blocking all sunlight.

The combination of easy basin access, no splash-out and minimized algae growth saves the end user money on maintenance hours, water consumption and water treatment costs.

"Clean Pan" Basin Design

EVAPCO coolers features a completely sloped basin from the upper to lower pan section. This "Clean Pan" design allows the water to be completely drained from the basin. The cooler water will drain from the upper section to the depressed lower basin section where the dirt and debris can be easily flushed out through the drain. This design helps prevent buildup of sedimentary deposits, biological films and minimizes standing water.



Sloped Basin

Maintenance Free ZMII® Spray Nozzle Water Distribution System

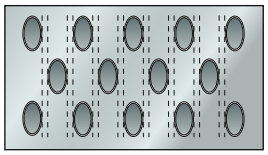
EVAPCO'S Zero Maintenance ZMII® Spray Nozzle remains clog-free while providing even and constant water distribution for reliable, scale-free evaporative cooling under all operating conditions.

ZMII® Nozzle

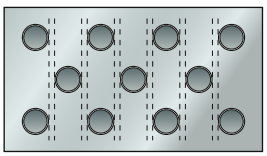
The heavy duty nylon ZMII® Spray nozzles have a 33 mm diameter opening and a 38 mm splash plate clearance. Furthermore, the fixed position ZMII® nozzles are mounted in corrosion-free PVC water distribution pipes. Together, these elements combine to provide unequaled coil coverage and scale prevention, and make the industry's best performing non-corrosive, maintenance-free water distribution system.

Cooling Coil

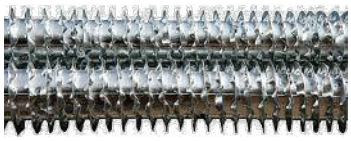
The new eco-ATWB-E Closed Circuit Cooler utilizes Evapco's patent pending **Ellipti-*fin*** coil design which assures even greater operating efficiency. The elliptical tube design allows for closer tube spacing, resulting in greater surface area per plan area than round-tube coil designs. In addition, the revolutionary **Ellipti-*fin*** design utilizes elliptical spiral fin coil technology and has lower resistance to airflow than typical finned coil designs. This permits greater water loading, making the new **Ellipti-*fin*** coil the most effective design available.



Thermal-Pak® Coil by EVAPCO



Round Tube Coil by Others



The coils are manufactured from high quality internally enhanced ***CROSS*coolTM**carbonsteel tubing following the most stringent quality control procedures.
Each circuit is inspected to ensure the material quality and then tested before being assembled into a coil and encased in a steel framework. Finally, the assembled coil is pneumatically tested in accordance with the "Pressure Equipment Directive" - PED 97/23 EC.

After fabrication, to protect the coil against corrosion, the entire assembly is hot-dip galvanized.

OPTIONAL EQUIPMENT

eco-ATWB-E

Two Speed Motors

Two speed fan motors can provide an excellent means of capacity control. In periods of lightened loads or reduced wet bulb temperatures, the fans can operate at low speed, which will provide about 60% of full speed capacity, yet consume only about 15% of the power compared with high speed. In addition to the energy savings, the sound levels of the units will be greatly reduced at low speed.

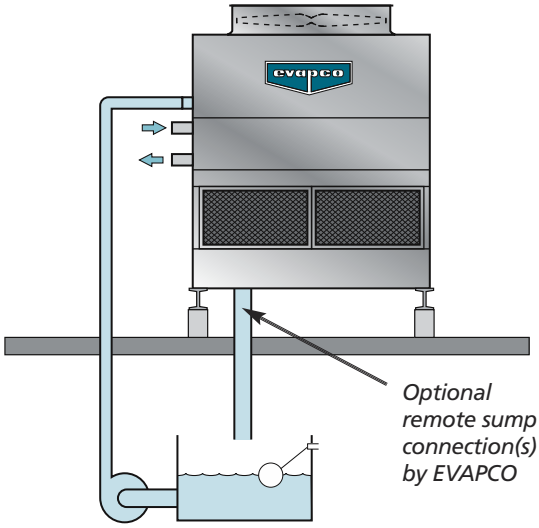
Inverter Duty Motors

Inverter Duty motors are available for cooler applications which utilize variable frequency drive systems for capacity control. Inverter Duty motors offer totally enclosed premium efficiency construction which is designed for variable frequency drive applications.

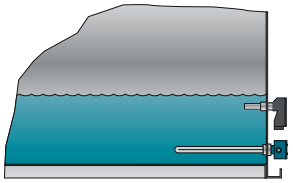
Note: Other special motor configurations are available to meet specific proper requirements. Contact your local EVAPCO sales representative for application assistance and motor availability.

Remote Sump Configuration

For units operating in areas where temperatures may be very low, or where low temperatures may occur during periods when the unit is not operating, a sump located inside the building is the preferred means of ensuring that the basin water will not freeze. For these applications, the cooler will be supplied without the spray pump, suction strainers and all associated piping, but with an oversize bottom outlet.

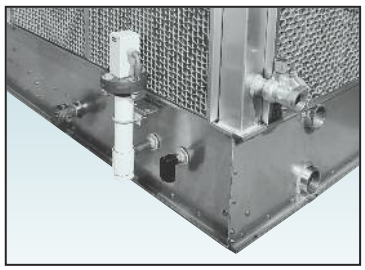


Basin Heater Package



If a remote sump configuration is not practical, electric basin heater packages are available to help prevent freeze-up of the basin water. The packages include electric heater elements and a combination with thermostat and low water cut-off. (Consult EVAPCO for heater size and application)

Electric Water Level Control



Evaporative coolers may be ordered with an electric water level control in lieu of the standard mechanical float and make-up assembly. This package provides accurate control of water levels and does not require field adjustment.

Multiple Circuit Coils

Coolers may be supplied with multiple circuit coils to match various system requirements such as split systems.

Self Supporting Service Platforms

Coolers are available with self-supporting service platforms that include access ladders which are designed for easy field installation. This option offers significant savings in comparison to field constructed, externally supported catwalks. The EVAPCO service platform option will be installed in front of the fan access doors.

Motor Davit

In the event that a fan and/or fan motor should need to be replaced, a motor davit is available from which a chain fall can be mounted to easily lower the motor/fan to the ground.

eco-ATWB-E Cooler with Optional Service Platform and Motor Davit

eco-ATWB-E

APPLICATION

Design
Evapco units are of heavy-duty construction and designed for long trouble-free operation. Proper equipment selection, installation and maintenance is, however, necessary to ensure full unit performance. Some of the major considerations in the application of a cooler are presented below. For additional information, please contact the factory.

Air Circulation
It is important that proper air circulation be provided. The best location is on an unobstructed roof top or on ground level away from walls and other barriers. Those closed circuit coolers located in wells, enclosures or adjacent to high walls must be properly located to avoid the problems associated with recirculation. Recirculation raises the wet bulb temperature of the entering air causing the water temperature to rise above the design. For these cases, the discharge of the fan should be located at a height even with the adjacent wall, thereby reducing the chance of recirculation. For additional information, see the Evapco Equipment Layout Manual.
Good engineering practice dictates that the closed circuit cooler discharge air not be directed or located close to or in the vicinity of building air intakes.

Piping
Cooler piping should be designed and installed in accordance with generally accepted engineering practices. The piping layout should be symmetrical on multiple unit systems, and sized for a reasonably low water velocity and pressure drop.
The standard closed circuit cooler is recommended only on a closed, pressurized system. The piping system should include an expansion tank to allow for fluid expansion and purging air from the system.
Note: Closed Circuit Coolers should never be used on an open system. Continual aeration of the water in an open system can cause corrosion inside the tubes of the cooler leading to premature failure.
The piping system should be designed to permit complete drainage of the heat exchanger coil. This will require a vacuum breaker or air vent to be installed at the high point and a drain valve installed at the low point of the piping system. Both must be adequately sized.
All piping should be securely anchored by properly designed hangers and supports. No external loads should be placed upon the cooler connections, nor should any of the pipe supports be anchored to the cooler framework.

Recirculating Water System
The surest way to protect the recirculating water system from freezing is with a remote sump. The remote sump should be located inside the building and below the unit. When a remote sump arrangement is selected, the spray pump is provided by others and installed at the remote sump. All water in the closed circuit cooler basin should drain to the remote sump when the spray pump cycles off. Refer to page 11 for concept illustration.
Other freeze protection methods are available when a remote sump is not feasible. Electric pan heaters, steam or hot water coils can be used to keep the pan water from freezing when the unit cycles off. Water lines to and from the unit, spray pump and related piping should be heat traced and insulated up to the overflow level in order to protect from freezing.

Freeze Protection
If the units are installed in a cold climate and operated year-round, freeze protection must be provided for the heat exchanger coil in the unit as well as for the recirculating water system.

eco-ATWB-E	std coil(s)	series flow coil(s)
Width (mm)	l/s	l/s
2283	10,1	5,1
2388	10,1	5,1
2991	11,9	6,0
3607	14,7	7,4

Heat Exchanger Coil
The simplest and most foolproof method of protecting the heat exchanger coil from freeze-up is to use a glycol solution. If this is not possible, an auxiliary heat load must be maintained on the coil at all times so that the water temperature does not drop below 10°C when the cooler is shut down. Also, a minimum recommended flow rate must be maintained.

Maintaining the Recirculated Water System
The heat rejection in a condenser is accomplished by the evaporation of a portion of the recirculated spray water. As this water evaporates, it leaves behind all of its mineral content and impurities. Therefore, it is important to bleed-off an amount of water equal to that which is evaporated to prevent the build-up of these impurities. If this is not done, the mineral or the acidic nature of the water will continue to increase. This will ultimately result in heavy scaling or a corrosive condition.

Bleed-off
Each unit supplied with a pump mounted on the side is furnished with a clear bleed line for visual inspection and a valve which, when fully open, will bleed-off the proper amount of water. If the make-up water supplying to the unit is relatively free of impurities, it may be possible to cut back the bleed, but the unit must be checked frequently to make sure scale is not forming. Make-up water pressure should be maintained between 140 and 340 kPa.

APPLICATION

eco-ATWB-E

Water Treatment

In some cases the make-up water will be so high in mineral content that a normal bleed-off will not prevent scaling. In this case, water treatment will be required and a reputable water treatment company familiar with the local water conditions should be consulted.

Units constructed of galvanized steel operating with circulating water having a pH of 8,3 or higher will require periodic passivation of the galvanized steel to prevent the formation of "white rust".

Any chemical water treatment used must be compatible with the galvanized construction of the unit. If acid is used for treatment, it should be accurately metered and the concentration properly controlled. The pH of the water should be maintained between 7 and 8,8. Batch chemical feeding is not recommended because it does not afford the proper degree of control. If acid cleaning is required, extreme caution must be exercised and only inhibited acids recommended for use with galvanized construction should be used.

Control of Biological Contamination

Water quality should be checked regularly for biological contamination. If biological contamination is detected, a more aggressive water treatment and mechanical cleaning program is required. The water treatment program should be performed in accordance with local legislation and in conjunction with a qualified water treatment company.

It is important that all internal surfaces be kept clean of accumulated dirt or sludge. In addition, the drift eliminators should be kept in good operating condition to minimize water from exiting the evaporative cooling unit in the discharge air. To minimize the risk of biological contamination, at initial start up or after an extended shut down, it is recommended that the cooler be properly treated. Clean all debris such as leaves and dirt from the unit. Completely fill the basin to the overflow level with fresh water. Initiate a biocide water treatment or shock treatment program prior to operating the unit. It is preferable that all such procedures be conducted or supervised by a water treatment specialist.

FM Approval

FM (Factory Mutual) Global is a mutual insurance company, which evaluates hazards and recommends improvements to property to reduce risks if a disaster like fire occurs.

EVAPCO's eco-ATWB-E closed circuit cooler can be executed to meet the FM approval standard.

To be in compliance with this standard the closed circuit coolers are improved with the following modifications:

- Water distribution system will be constructed out of galvanized steel for single cell units and out of PVC for multi cell units. Nozzles remain ABS plastic.
- Special full scale tested and approved PVC louver and eliminator material.
- Internal partition walls between cells and louver screens to avoid fire propagation.
- Air inlet louvers are provided with 1" x 1" hot dipped galvanized or stainless steel screens in front of the PVC air inlet material.
- Units with louvers more than 4' tall are provided with galvanized or stainless steel fire-walls which extend out from the unit 12" and are attached to the vertical supports between adjoining cells.
- Increased thickness of steel construction panels to improve fire resistance.
- Aluminum axial fans on single cell units, SLSF only on multi cell units for redundancy.

Some Useful Manuals available on EVAPCO Web-site

eco-ATWB-E

APPLICATION

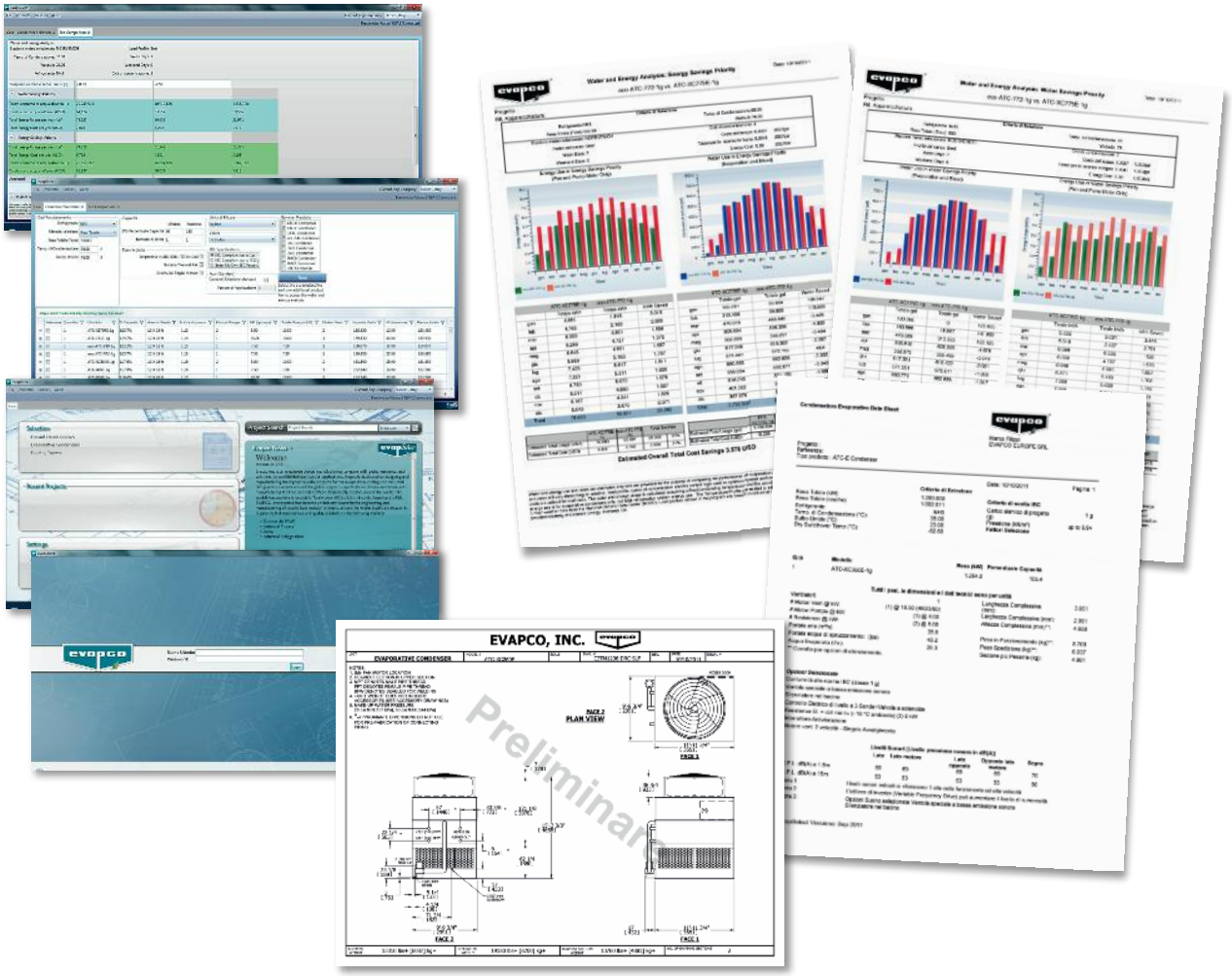
Technical Support Services

EVAPCO's evap*Select*™ Equipment Selection Program

Evap*Select*™ is a Web based computer selection program which allows the design engineer to choose EVAPCO models and optimize unit selections. The program allows the engineer to evaluate the equipment's thermal performance, space, energy requirements and water consumption. Once the model is selected and optional equipment features are inserted, the engineer may output a complete specification **AND** a unit drawing from this program.

The software is designed to provide the user with maximum flexibility in analyzing the various selection parameters while in a friendly and familiar Windows format.

The **Evap*Select*™** software is available to all consulting engineering offices and design-build contractors. The programs are distributed through the local EVAPCO sales representative or the EVAPCO offices.



EVAPCO's Website

Log on to EVAPCO's new and improved website **http://www.evapco.eu** for expanded product information. Product literature, Rigging and Maintenance Instructions are all accessible online from your computer.

The **Evap*Select*™** Equipment Selection Software program may be accessed using Microsoft Internet Explorer after contacting your local EVAPCO sales representative. Users may make Requests for Quotation through the website or by e-mailing EVAPCO at this address:

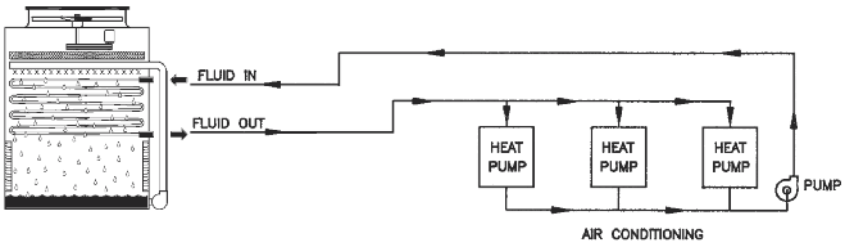
evapco.europe@evapco.eu

With the Evap*Select*™ program, equipment selections, written specifications, unit drawing files and EVAPCO on-line information are readily available from the comfort of your own office!

APPLICATION

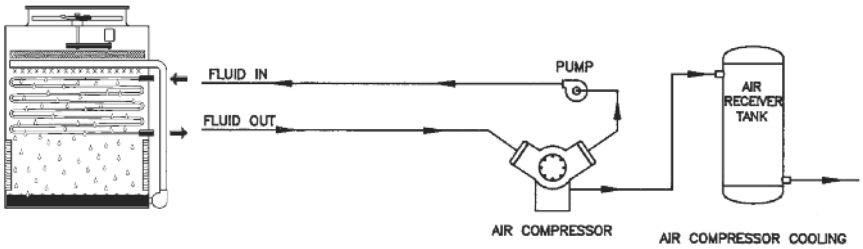
eco-ATWB-E

Some application ...



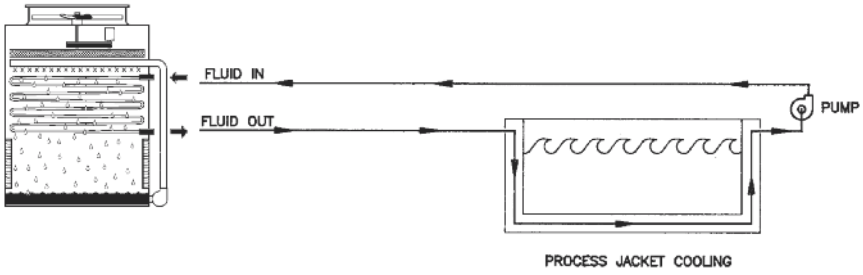
Air Conditioning

- Unitary Heat Pump Systems
- Computer Room Cooling
- Refrigeration Supplement



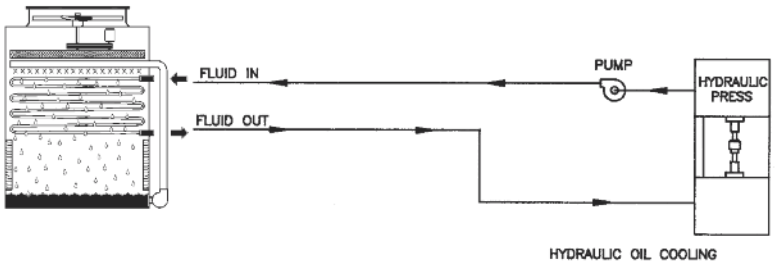
Manufacturing

- Air Compressors
- Plastic Mold Machines
- Transformers
- Engines



Steel Mills & Foundries

- Quench Tanks
- Rolling Mills
- Induction Furnaces
- Continuous Casters



Industrial Fluids

- Hydraulic Oils
- Plating Solutions
- Quench Oils

eco-ATWB-E

Notes:

eco-ATWB-E

Ultra Quiet Closed Circuit Coolers

The New EVAPCO eco- Coolers eco-ATWB-E are now available with four (4) equipment options to reduce the overall sound generated from the side or top.

Each option provides various levels of sound reduction and can be used in combination to provide the lowest sound level.

Ultra Quiet operation for induced draft counterflow Closed Circuit Coolers

eco-ATWB-E

ADVANCED TECHNOLOGY LOW SOUND SOLUTIONS

Super Low Sound Solution for Sound Sensitive Applications

Family of Super Low Sound Fans

The Super Low Sound Fan

Reduced Sound Levels versus Model eco-ATWB-E Standard Fan

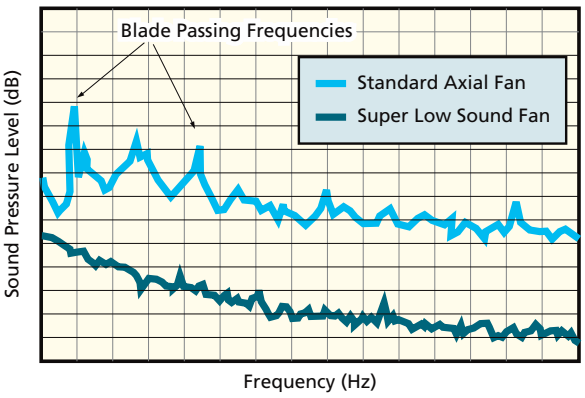
EVAPCO's Super Low Sound Fan on the **eco-ATWB-E** Closed Circuit Coolers utilizes an extremely wide chord blade design applied for sound sensitive applications where the lowest sound levels are desired. The fan is one piece molded heavy duty FRP construction utilizing a forward swept blade design. The Super Low Sound Fan reduces sound levels 9 to 15 dB(A) compared to the Model ATW standard fan.

Improved Sound Quality versus Model eco-ATWB-E Standard Fan

The SUPER Low Sound Fan on the **eco-ATWB-E** Closed Circuit Cooler reduces sound levels 9-15 dB(A) and eliminates audible blade passing frequencies indicative of straight bladed axial type fans.

Refer to the Narrow Band Spectrum graph which shows how straight bladed axial fans produce blade passing frequencies – the same phenomena that produce the signature pulsating helicopter noise.

The blade passing frequencies are audible spikes in sound pressure levels, but are not apparent in the octave band sound spectrum.



Narrow Band Spectrum Analysis

*The Super Low Sound Fan on the **eco-ATWB-E** Closed Circuit Cooler reduces sound levels and betters the sound quality!*

NOTE: These low sound options may impact the overall installed dimensions of the eco-ATWB-E Closed Circuit Cooler selected.

ADVANCED TECHNOLOGY LOW SOUND SOLUTIONS

eco-ATWB-E

Additional Solutions for Sound Sensitive Applications

Low Sound Fan *4 – 7 dB(A) Reduction!*

The Low Sound Fan offered by EVAPCO is a wide chord blade design for sound sensitive applications where low sound levels are desired. The Low Sound Fan shall utilize a unique soft-connect blade-to-hub design that is compatible with Variable Speed Drives.

The Low Sound Fan is capable of reducing the unit sound pressure levels 4 dB(A) to 7 dB(A), depending upon specific unit selection and measurement location. The fans are high efficiency axial propeller type and are available on 2.4 m wide and larger eco-ATWB-E Closed Circuit Coolers.

Water Silencer

Reduces Water Noise in the Cold Water Basin up to 7 dB(A)!

The water silencer option is available for all induced draft models and is located in the falling water area of the cold water basin. The water silencer will reduce the high frequency noise associated with the falling water and is capable of reducing overall sound levels **4 dB(A) to 7 dB(A)** measured at 1.5 m from the side or end of the unit. The water silencers reduce overall sound levels **9 dB(A) to 12 dB(A)** (depending on water loading and louver height) measured 1.5 m from the side or end of the unit when water is circulated with fans off.

The water silencers are constructed of lightweight PVC sections and can be easily removed for access to the basin area. *The water silencer will have no impact on unit thermal performance.*

The Water Silencer is available on ALL eco-ATWB-E Closed Circuit Coolers.

Consult **Evap*Select*™** software for unit sound levels. If a detailed analysis or full octave band data sheet is required for your application, please consult your EVAPCO Sales Representative.

eco-ATWB-E

SOUND BASIC

Background in Sound Basics

Sound

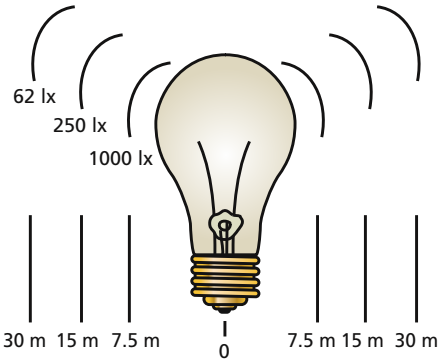
Sound is the alteration in pressure, stress, particle displacement and particle velocity, which is propagated in an elastic material. Audible sound is the sensation produced at the ear by very small pressure fluctuations in the air.

Sound Pressure

Sound pressure is the *intensity* of sound. Sound pressure, L_p in decibels is the ratio of measured pressure, P in the air to a reference sound pressure, $P_o = 2 \times 10^{-5}$ Pascal following the following formula:

L_p (dB) = 10 $\log_{10}$ ($\triangle P^2 / \triangle P_o^2$)

The most important point to understand about sound pressure level is that **sound pressure level is what is actually being measured when sound data is recorded.** Microphones that measure sound are pressure sensitive devices that are calibrated to convert the sound pressure waves into decibels.



"SOUND PRESSURE"

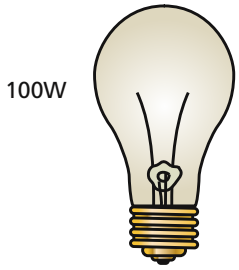
Similar to the intensity coming from a light bulb which gets dimmer as one gets further and further away, sound pressure decreases in decibels as your ear gets further from the sound source.

Sound Power

Sound Power is the *energy* of sound. Sound power, L_w in decibels is the ratio of the calculated sound power, W to a reference power, W_o=1 picowatt, according to the following formula:

L_w (dB) = 10 $\log_{10}$ (W/W_o)

The most important point to remember about **sound power level is that sound power level is not a measured value, but is calculated based on the measured sound pressure.**



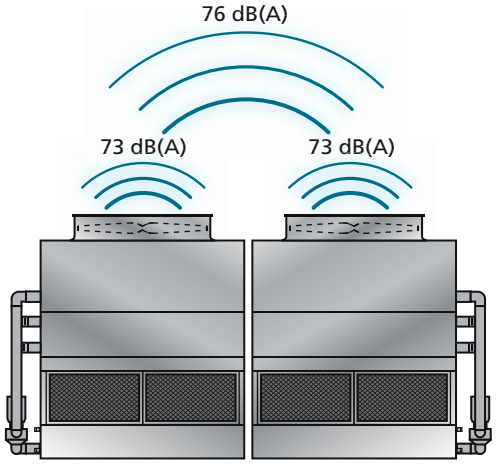
"SOUND POWER"

Similar to the wattage of a light bulb that does not change the farther one is away from the light bulb, sound power does not vary with distance.

Adding Multiple Sound Sources

Since the decibel is a logarithmic function, the numbers are not added linearly. Therefore, two 73 dB sound sources added together do not equal 146 dB. The resultant sound would actually be 76 dB. The following table shows how to add decibels from two sound sources.

Difference in dB Level	Add to the higher dB Level
0 to 1	3
2 to 3	2
4 to 8	1
9 or greater	0

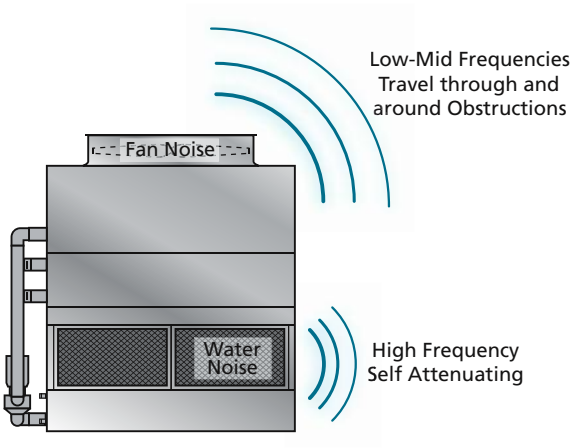


SOUND BASIC

eco-ATWB-E

Sound Science and Closed Circuit Coolers

Sound Frequency



Fan Noise

- Low / Mid frequencies that travel long distances, through walls, and around obstructions.
- Very difficult to attenuate. Reduce fan noise by using Low Sound Fans.
- Dominates what is measured and heard at the Closed Circuit Cooler and at the sound sensitive location.

Water Noise

- High frequencies that attenuate naturally with distance. Attenuated easily by walls, trees or other obstructions.
- Totally masked and drowned out by fan noise at a short distance away from the Closed Circuit Cooler.

Sound Pressure – The A-Weighted Scale

The A-weighted scale, dB(A) is a means to translate what a sound meter microphone measures to how the human ear perceives the sound.

dB(A) Formula and Conversions:

$$dB(A) = 10 \log_{10} \sum_{f=63}^{f=8000} 10^{((dB+Cf)/10)}$$

where: C_f = correction factor per band
dB = measured sound pressure
let: $Z_f = (dB + Cf)/10$

Band	Center Freq. (Hz)	Frequency Range (Hz)	Sample Data (dB)	Cf (dB)	Z_f
1	63	44-88	68	-26.2	4.18
2	125	89-175	76	-16.1	5.99
3	250	176-350	77	-8.6	6.84
4	500	351-700	73	-3.2	6.98
5	1000	701-1400	70	0	7.00
6	2000	1401-2800	68	+1.2	6.92
7	4000	2801-5600	71	+1.0	7.20
8	8000	5601-11200	73	-1.1	7.19

Typical Sound Pressure Levels of Well Known Noises:

Jet Airplane, 45 meters away	140 dB(A)
Painful	130 dB(A)
Very Uncomfortable	120 dB(A)
Circular Saw	110 dB(A)
Nightclub	100 dB(A)
Semi Truck	90 dB(A)
Sidewalk of a Busy Road	80 dB(A)
Household Vacuum, 1 meter away	70 dB(A)
Normal Conversation	60 dB(A)
Inside Average Home	50 dB(A)
Quiet Library	40 dB(A)
Bedroom at Night	30 dB(A)

Notable Facts about Sound:

- +/- 1 dB(A) is inaudible to the human ear
- Decreasing a noise source by 10 dB(A) sounds half as loud to the human ear

Example calculation of the dB(A) formula using the Sample Data above.

$dB(A) = 10 \log_{10} \sum 10^{(Z1)} + 10^{(Z2)} + 10^{(Z3)} + 10^{(Z4)} + 10^{(Z5)} + 10^{(Z6)} + 10^{(Z7)} + 10^{(Z8)}$
$= 10 \log_{10} (67114245.2) = 78.3$ dB(A)

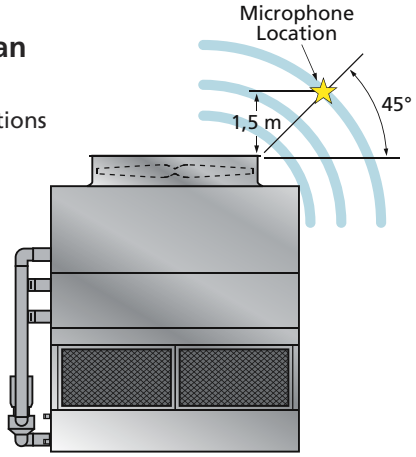
eco-ATWB-E

SPECIFYING SOUND

Sound Verifications

Specify sound pressure in dB(A) measured 1,5 m above the fan discharge during full speed operation.

- All manufacturers can meet a performance specification with Low Sound Options
- Fan noise is what matters. 1,5 m above the fan is where it matters.



Measurement Location

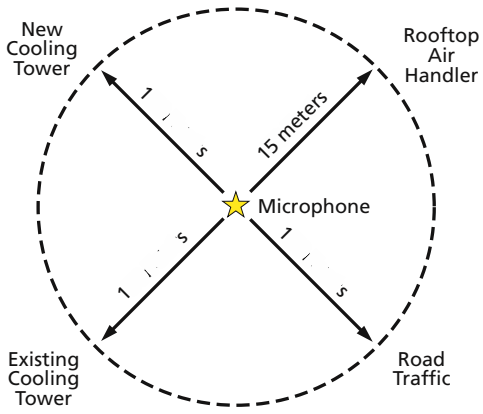
Per Cooling Technology Institute Standard ATC-128

Sound Microphone location 1,5 m above the closed circuit cooler fan cowl edge at a 45° angle.

This position assures accurate sound measurements by eliminating a source of uncertainty by taking the microphone out of the high velocity fan discharge air.

Easy Verification

At 1,5 m from the Closed Circuit Cooler, a sound meter records only closed circuit cooler noise. Interested parties can easily verify the actual noise coming from the closed circuit cooler against the specified sound data with good certainty.



If sound were specified at 15 meters or some greater distance from the sound sensitive location, there is increased uncertainty in the measured data due to other possible sound sources within the 15 meters radius of the sound microphone.

Sound Quality

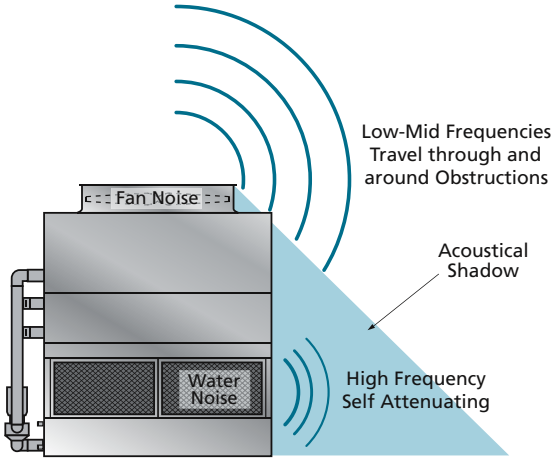
Sound coming from the top of the closed circuit cooler is comprised of low- and mid-frequency fan noise. Low- and mid-frequency fan "rumble" is very difficult to attenuate. Fan rumble travels through everything and around everything and what is audible at any sound sensitive location.

Sound coming from the sides of the Closed Circuit Cooler is comprised of high frequency water noise, is much less objectionable than fan noise and attenuates naturally with distance.

Acoustical Shadow*

"Subjective reactions to the overall noise generated by Closed Circuit Coolers indicate that as one walks away from a tower intake, a point is reached where the water noise is masked by the fan noise. The point coincides with the point at which one emerges from the acoustical shadow of the Closed Circuit Cooler structure, which shields intake water noise from discharge fan noise."

*Seelbach & Oran, "What To Do About Cooling Tower Noise", Industrial Acoustics Company.



Sound measured at the side of a Closed Circuit Cooler is inside the acoustical shadow of the noise emitted from the top. Outside the acoustical shadow, the low- and mid-frequency fan noise completely masks the high frequency water noise.

Specify fan noise because it matters! Specify fan noise where it matters!

SOUND

eco-ATWB-E

We Stand Tall Through it All!

Wind, Rain, Earthquake and Hurricane

The International Building Code (IBC) is a comprehensive set of regulations addressing the structural design and installation requirements for building systems – including HVAC and industrial refrigeration equipment.

With the advent of the IBC, EVAPCO is proud to introduce the new and improved line of eco-ATWB-E Closed Circuit Coolers with IBC 2012 compliance standard.

EVAPCO Closed Circuit Coolers... designed to withstand seismic or wind load forces.

eco-ATWB-E

IBC COMPLIANCE

In its continuing commitment to be the leaders in evaporative cooling equipment design and services, EVAPCO eco-ATWB-E Closed Circuit Coolers are now ***Independently Certified*** to withstand Seismic and Wind Loads in accordance with IBC 2012.

What is IBC?

International Building Code

The International Building Code (IBC) is a comprehensive set of regulations addressing both the structural design and the installation requirements for building systems – including HVAC and industrial refrigeration equipment. Compared to previous building codes that considered only the building structure and component anchorage, the requirements contained within the IBC address anchorage, structural integrity, and the operational capability of a component following either a seismic or wind load event. **Simply stated, the IBC code provisions require that evaporative cooling equipment, and all other components permanently installed on a structure, must be designed to meet the same seismic or wind load forces as the building to which they are attached.**

How Does IBC 2012 Apply to Closed Circuit Coolers?

Based on site design factors, calculations are made to determine the equivalent seismic "g force" and wind load (kilo-Newton per square meter, kN/m²) on the unit. The closed circuit cooler must be designed to withstand the greater of either the seismic or wind load.

The New eco-ATW is offered with a choice of TWO structural design packages:

- **Standard Structural Design** – For projects with ≤1.0g seismic or 6,94 kN/m² wind loads
- **Upgraded Structural Design** – Required for projects with >1.0 g seismic or 6,94 kN/m² wind loads

All locations with design criteria resulting in a seismic design force of up to 1.0g or a wind load of 6,94 kN/m² or below will be provided with the standard eco-ATW structural design. An upgraded structural design is available for installations with design criteria resulting in "g forces" greater than 1.0g. The highest "g force" location in North America is 5.12g. The highest wind load shown on the maps is 273 km/h, which is approximately equal to 6,94 kN/m² velocity pressure. **Therefore, the upgraded structural design package option for the New eco-ATWB-E is designed for 5.12 g and 6,94 kN/m² making it applicable to most building locations worldwide.**

Design Implementation

EVAPCO applies the seismic design and wind load information provided for the project to determine the equipment design necessary to meet IBC requirements. This process ensures that the mechanical equipment and its components are compliant per the provisions of the IBC as given in the plans and specifications for the project.

Independent Certification

Although the IBC references and is based on the structural building code ASCE 7, many chapters and paragraphs of ASCE 7 are superceded by the IBC, independent certification and methods of analysis are such paragraphs. Per the most recent edition of the code, the EVAPCO compliance process included an exhaustive analysis by an independent approval agency. As required by the International Building Code, EVAPCO supplies a certificate of compliance as part of its submittal documents. The certificate of compliance demonstrates that the equipment has been independently tested and analyzed in accordance with the IBC seismic and wind load requirements. Evapco has worked closely with the independent approval agency, The VMC Group, to complete the independent equipment testing and analysis.

If the seismic "g force" or wind load psf requirements for the project site are known, EVAPCO's online equipment selection software, **Evap*Select*™**, will allow you to choose the required structural design package – either standard construction or upgraded construction.

For further questions regarding IBC compliance, please contact your local EVAPCO Representative.


evapco

Certificate of Compliance

AT, USS, UAT, UT Cooling Towers
eco-ATW/WE, ATW(B) and ESWA Closed Circuit Coolers
eco-ATC, ATC-E Evaporative Condensers

Are certified to meet or exceed the Seismic and Wind Load Provisions set forth in the applicable building codes for this project.

These products have been manufactured following all applicable quality assurance programs.

Applicable Building Codes:
IBC 2012
ASCE-7
NFPA 5000

Referenced Report:
VMA-43387

Approval Agency:
VMC Seismic Consulting Group

EVAPCO...Specialists in Heat Transfer Products and Services.

ID IBC COC 001

eco-ATWB-E

eco-ATWB-E Closed Circuit Coolers

EUROVENT CERTIFIED PERFORMANCE
www.eurovent-certification.com

Eurovent-CTI Certification Purpose

This standard sets forth a program whereby the Cooling Technology Institute will certify that all models of a line of evaporative heat rejection equipment offered for sale by a specific manufacturer will perform thermally in accordance with the manufacturer's published ratings...

Technology for the Future, Available Today!

eco-ATWB-E

CTI CERTIFICATION

In its continuing commitment to be the leaders in evaporative cooling equipment design and services, EVAPCO eco-ATWB-E Closed Circuit Coolers are now ***Independently Certified*** by ***CTI***, to perform thermally in accordance with the published data.

What is CTI?

Cooling Technology Institute

The Cooling Technology Institute is an organization headquartered in the United States with over 400 member companies from around the globe. CTI membership is composed of manufacturers, suppliers, owner operators, and test agencies from over 40 countries. In 2008 CTI certified more than 5000 Evaporative Heat Transfer Systems (EHTS) from 49 product line of 24 participants.

CTI's Mission and Objectives

This can be best explained by the CTI's published Mission statement and Objectives revised in December 2003 and published on their website **www.cti.org**.

CTI Mission Statement

To advocate and promote the use of environmentally responsible Evaporative Heat Transfer Systems (EHTS) for the benefit of the public by encouraging:

- Education
- Research
- Standards Development and Verification
- Government Relations
- Technical Information Exchange

CTI Objectives

- Maintain and expand a broad base membership of individuals and organizations interested in Evaporative Heat Transfer Systems (EHTS).
- Identify and address emerging and evolving issues concerning EHTS.
- Encourage and support educational programs in various formats to enhance the capabilities and competence of the industry to realize the maximum benefit of EHTS.
- Encourage and support cooperative research to improve EHTS technology and efficiency for the long-term benefit of the environment.
- Assure acceptable minimum quality levels and performance of EHTS and their components by establishing standard specifications, guidelines, and certification programs.
- Establish standard testing and performance analysis systems and procedures for EHTS.
- Communicate with and influence governmental entities regarding the environmentally responsible technologies, benefits, and issues associated with EHTS.
- Encourage and support forums and methods for exchanging technical information on EHTS.

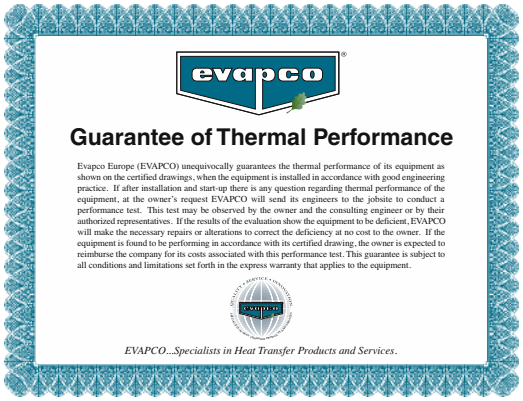
Benefits to the End User

CTI defines an independent testing certification program that is specifiable, enforceable and available to all equipment manufacturer's. End users that purchase CTI certified products are assured that those products will perform thermally as specified.
Additionally CTI certification is the first step for the Green Building Concept in Europe:

- LEED - Leadership in Energy and Environmental Design
- Best Available Practice
- Green Building Rating System

Thermal Performance Guarantee

In addition to the CTI Certification, Evapco unequivocally guarantees the Thermal Performance of ALL Evapco Equipment. Every unit order is confirmed with a submittal package that includes an Evapco Thermal Performance Guarantee Certificate.



CTI CERTIFICATION

eco-ATWB-E

CTI Certification Program

CTI Certification Process

- Submit Application for Certification
- CTI completes a technical review of the product line submitted
- CTI performs an initial qualification test in a laboratory on a specified model number
- CTI issues an Approval Letter with Validation Number if test is passed. Letter is also distributed to all members of CTI to inform everyone that a successfull certification has been completed. The Certification Validation Number assigned should be fixed to each tower sold and displayed in all catalogs and other literature
- Product Line must undergo an Annual Reverification Test - Different model number is selected every year
- More details can be found on the CTI website **www.cti.org**

CTI Certification Test Parameters

- Entering Wet Bulb temperature - 12.8°C to 32.2°C
- Cooling Range - Minimum of 2.2°C
- Cooling Approach - Minimum of 2.8°C
- Process Fluid Temperature - Maximum of 51.7°C
- Barometric Pressure - 91.4 to 105 kPa
- More details can be found on the CTI website **www.cti.org**

CTI Certification Limitations

- Specific manufacturer's product line name and model numbers
- Applicable only to product lines and model numbers submitted
- Multiple cell model numbers are allowed if the airflow is not affected or the configuration impact is included in the unit rating
- Optional accessories are allowed if the aiflow is not affected or the accessory impact is accounted for in the rating
- More details can be found on the CTI website **www.cti.org**

Evapco Europe CTI Certified eco-ATWB-E Product Line

eco-ATWB-E lines of CTI Certified Closed Circuit Coolers

- Includes the use of side, end or bottom water inlet configuration
- Includes optional Super Low Sound Fan (SLSF)
- Includes optional pan Water Silencers (WS)
- Includes optional external service platform and ladders for access
- **Evap*Select*™** Technical data sheet will state "CTI Certified Selection" if the selection falls within the CTI Certification Test Parameters
- Unit will receive a CTI Certified Shield located near the nameplate

Note

All CTI Certified Product Lines of all manufacturers with CTI certified products can be found on the website: **http://www.cti.org/certification.shtml**

CTI CERTIFIED

Mark owned by the Cooling Technology Institute

eco-ATWB-E EUROVENT-CTI CERTIFICATION

In 2007 Evapco launched the initiative to create the "European Chapter" of CTI. At the start of this initiative, Eurovent and CTI established a "Memorandum of Understanding". Since then the "Operational Manual for Certification of Cooling Towers" and the "Eurovent Rating Standard for Cooling Towers" were written. Both documents are strongly tied to the CTI documents STD 201 and ATC 105. A common **"Eurovent-CTI"** Certification program has become the European Standard for independent thermal performance rating of cooling towers.

EUROVENT – CTI cooperation

EUROVENT Association

Initially founded in 1958 EUROVENT Association represents the European refrigeration, air conditioning, air handling, heating and ventilation industry and trade associations from European and non-European countries. Over 1000 companies in 13 European countries, employing 150000 employees who jointly generate more than € 25 to 30 billion of annual output are member of this organization.

EUROVENT mission

EUROVENT represents, promotes and defends the industry to relevant national and international bodies and cooperates with other European umbrella associations. Over the years EUROVENT has become a well-known and respected stakeholder in all industry related matters and, in particular, in climate change and energy efficiency.
EUROVENT develops product certification programs for the entire industry through the EUROVENT Certification Company.

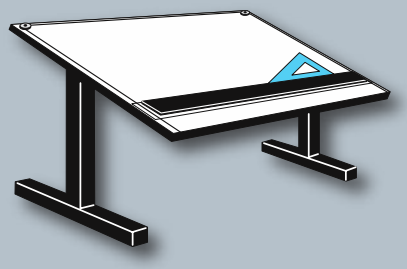
EUROVENT Certification

The main objective of the EUROVENT Certification Company (ECC) is to certify cooling equipment (and/or components) independently from EUROVENT Association. With a common set of well-defined procedures and criteria for the rating of products, comparison of product performance ensures a healthy and solid competition on a market open to all manufacturers. When a manufacturer participates in a certification program, he has to present its list of models or model ranges together with their performance data. The files are evaluated by the ECC Certification and a predefined number of units are selected for testing by **independent laboratories**. If the results comply with the relevant standards, the submitted models or ranges will be listed in the **EUROVENT Certification Online Directory**. Models are subject to regular random testing to verify compliance with catalogue data.

Benefits

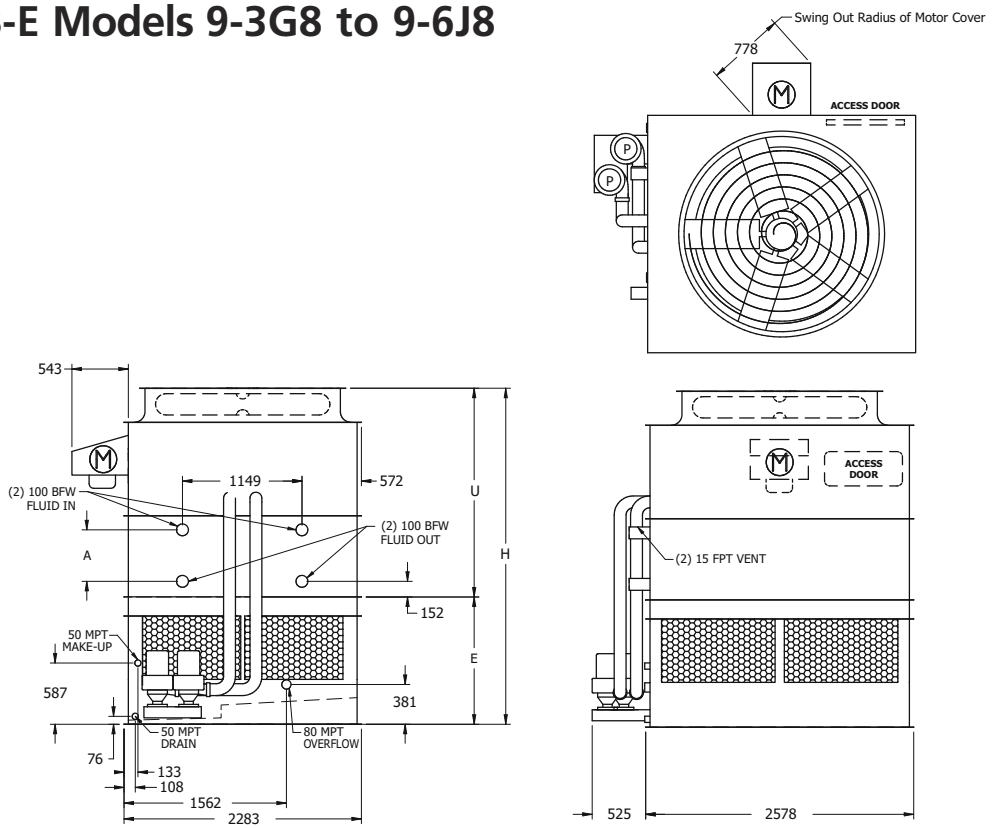
The Certification Mark guarantees specifying engineers, installers and end users that the products marketed by a participant have been submitted to independent testing and that they have been accurately rated.
Through specification of **certified products**, the engineer's tasks become easier, since there is no need to carry out detailed comparison and performance testing.

eco-ATWB-E



Engineering Data & Dimensions

eco-ATWB-E Models 9-3G8 to 9-6J8



Notes: The number of coil connections doubles when the flow rate exceeds 56 l/s.
For additional Weights and Heights of optional **Low & Super Low Sound Fan** execution, see table on page 43.

eco-ATWB-E Model Number	Weights (kg)			Fans		Spray Pump	Coil Volume	Remote Sump △			Dimensions (mm) ▲			
	Shipping	Heaviest Section†	Operating	kW	m²/s	kW	(liters)	Liters Req'd*	Conn. Size (mm)	Operating Weight (kg)	Height H	Lower E	Upper U	Coil A
eco-ATWB-E 9-3G8	3760	3100	5310	4	13,7	(2) 0.55	542	835	200	4780	3233	1226	2007	495
eco-ATWB-E 9-3H8	3780	3120	5330	5,5	15,7	(2) 0.55	542	835	200	4800	3233	1226	2007	495
eco-ATWB-E 9-3I8	3780	3120	5330	7,5	17,2	(2) 0.55	542	835	200	4800	3233	1226	2007	495
eco-ATWB-E 9-3J8	3840	3180	5390	11	19,3	(2) 0.55	542	835	200	4860	3233	1226	2007	495
eco-ATWB-E 9-4G8	4380	3720	6090	4	13,3	(2) 0.55	707	835	200	5560	3423	1226	2197	686
eco-ATWB-E 9-4H8	4400	3740	6110	5,5	15,2	(2) 0.55	707	835	200	5580	3423	1226	2197	686
eco-ATWB-E 9-4I8	4400	3740	6120	7,5	16,7	(2) 0.55	707	835	200	5590	3423	1226	2197	686
eco-ATWB-E 9-4J8	4460	3800	6180	11	18,7	(2) 0.55	707	835	200	5650	3423	1226	2197	686
eco-ATWB-E 9-5H8	5060	4400	6940	5,5	14,8	(2) 0.55	872	835	200	6410	3614	1226	2388	876
eco-ATWB-E 9-5I8	5060	4410	6950	7,5	16,2	(2) 0.55	872	835	200	6420	3614	1226	2388	876
eco-ATWB-E 9-5J8	5120	4460	7010	11	18,1	(2) 0.55	872	835	200	6480	3614	1226	2388	876
eco-ATWB-E 9-6H8	5710	5050	7760	5,5	14,3	(2) 0.55	1038	835	200	7230	3804	1226	2578	1067
eco-ATWB-E 9-6I8	5720	5060	7760	7,5	15,7	(2) 0.55	1038	835	200	7230	3804	1226	2578	1067
eco-ATWB-E 9-6J8	5780	5120	7820	11	17,6	(2) 0.55	1038	835	200	7290	3804	1226	2578	1067

The motors are shipped loose for field mounting

† Heaviest section is the coil / fan section

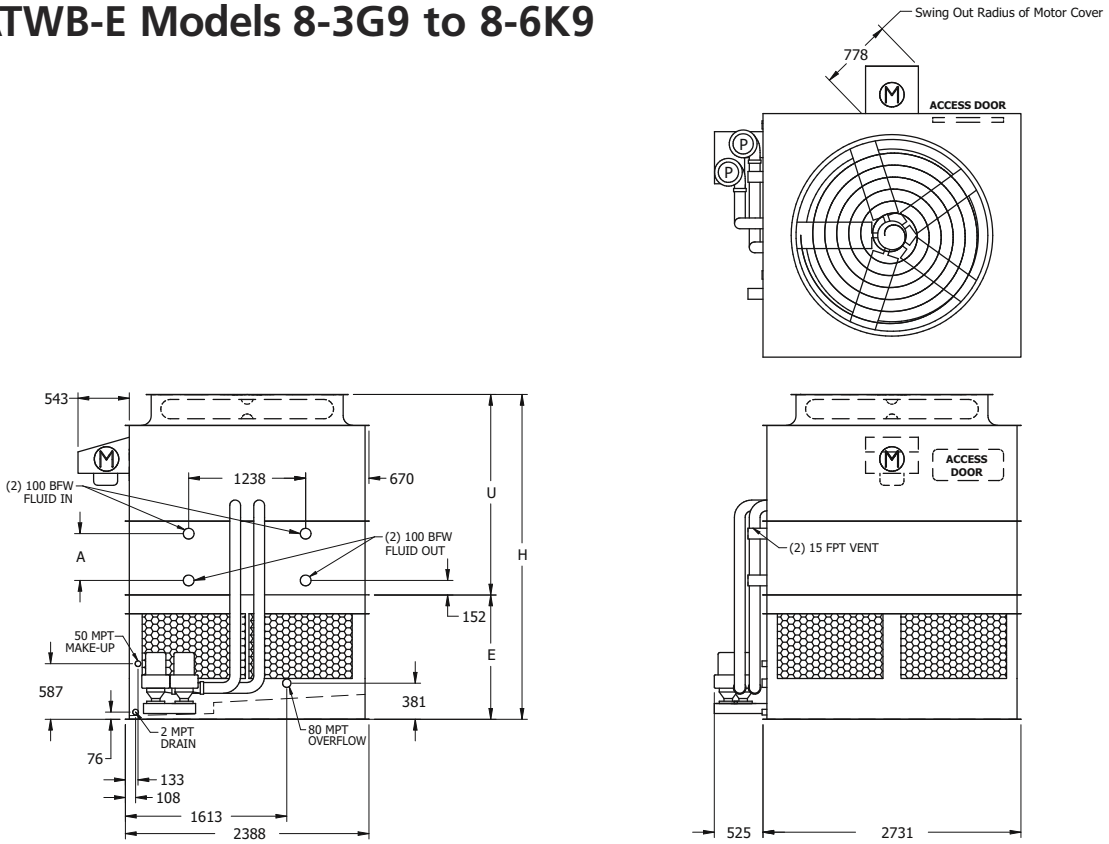
* Liters shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (300mm would normally be sufficient).

△ When a remote sump arrangement is selected, the spray pump, suction strainer and associated piping are omitted; the unit is provided with an oversized outlet to facilitate drainage to the remote sump.

▲ Unit dimensions and coil connections may vary slightly from catalog. See factory certified prints for dimensions, quantity of coil connections, and piping configuration.

Coil connections are 4" bevel for welding (BFW)

eco-ATWB-E Models 8-3G9 to 8-6K9



Notes: The number of coil connections doubles when the flow rate exceeds 56 l/s.
For additional Weights and Heights of optional **Low & Super Low Sound Fan** execution, see table on page 43.

eco-ATWB-E Model Number	Weights (kg)			Fans		Spray Pump	Coil Volume (liters)	Remote Sump △			Dimensions (mm) ▲			
	Shipping	Heaviest Section†	Operating	kW	m²/s	kW		Liters Req'd*	Conn. Size (mm)	Operating Weight (kg)	Height H	Lower E	Upper U	Coil A
eco-ATWB-E 8-3G9	4210	3500	5890	4	14,7	(2) 0.75	576	910	200	5300	3439	1318	2121	495
eco-ATWB-E 8-3H9	4230	3530	5920	5,5	16,8	(2) 0.75	576	910	200	5330	3439	1318	2121	495
eco-ATWB-E 8-3I9	4240	3530	5920	7,5	18,5	(2) 0.75	576	910	200	5330	3439	1318	2121	495
eco-ATWB-E 8-3J9	4300	3590	5980	11	20,7	(2) 0.75	576	910	200	5390	3439	1318	2121	495
eco-ATWB-E 8-4G9	4900	4190	6760	4	14,2	(2) 0.75	751	910	200	6170	3629	1318	2311	686
eco-ATWB-E 8-4H9	4920	4210	6780	5,5	16,3	(2) 0.75	751	910	200	6190	3629	1318	2311	686
eco-ATWB-E 8-4I9	4920	4220	6780	7,5	17,9	(2) 0.75	751	910	200	6190	3629	1318	2311	686
eco-ATWB-E 8-4J9	4980	4280	6840	11	20,1	(2) 0.75	751	910	200	6250	3629	1318	2311	686
eco-ATWB-E 8-4K9	5010	4300	6870	15	21,8	(2) 0.75	751	910	200	6280	3629	1318	2311	686
eco-ATWB-E 8-5G9	5630	4920	7670	4	13,8	(2) 0.75	926	910	200	7080	3820	1318	2502	876
eco-ATWB-E 8-5H9	5650	4950	7690	5,5	15,8	(2) 0.75	926	910	200	7100	3820	1318	2502	876
eco-ATWB-E 8-5I9	5660	4950	7690	7,5	17,4	(2) 0.75	926	910	200	7100	3820	1318	2502	876
eco-ATWB-E 8-5J9	5720	5010	7750	11	19,5	(2) 0.75	926	910	200	7160	3820	1318	2502	876
eco-ATWB-E 8-5K9	5740	5040	7780	15	21,1	(2) 0.75	926	910	200	7190	3820	1318	2502	876
eco-ATWB-E 8-6G9	6350	5650	8560	4	13,4	(2) 0.75	1102	910	200	7970	4010	1318	2692	1067
eco-ATWB-E 8-6H9	6380	5670	8590	5,5	15,3	(2) 0.75	1102	910	200	8000	4010	1318	2692	1067
eco-ATWB-E 8-6I9	6380	5670	8590	7,5	16,9	(2) 0.75	1102	910	200	8000	4010	1318	2692	1067
eco-ATWB-E 8-6J9	6440	5730	8650	11	18,9	(2) 0.75	1102	910	200	8060	4010	1318	2692	1067
eco-ATWB-E 8-6K9	6470	5760	8680	15	20,5	(2) 0.75	1102	910	200	8090	4010	1318	2692	1067

The motors are shipped loose for field mounting

† Heaviest section is the coil / fan section

* Liters shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (300mm would normally be sufficient).

△ When a remote sump arrangement is selected, the spray pump, suction strainer and associated piping are omitted; the unit is provided with an oversized outlet to facilitate drainage to the remote sump.

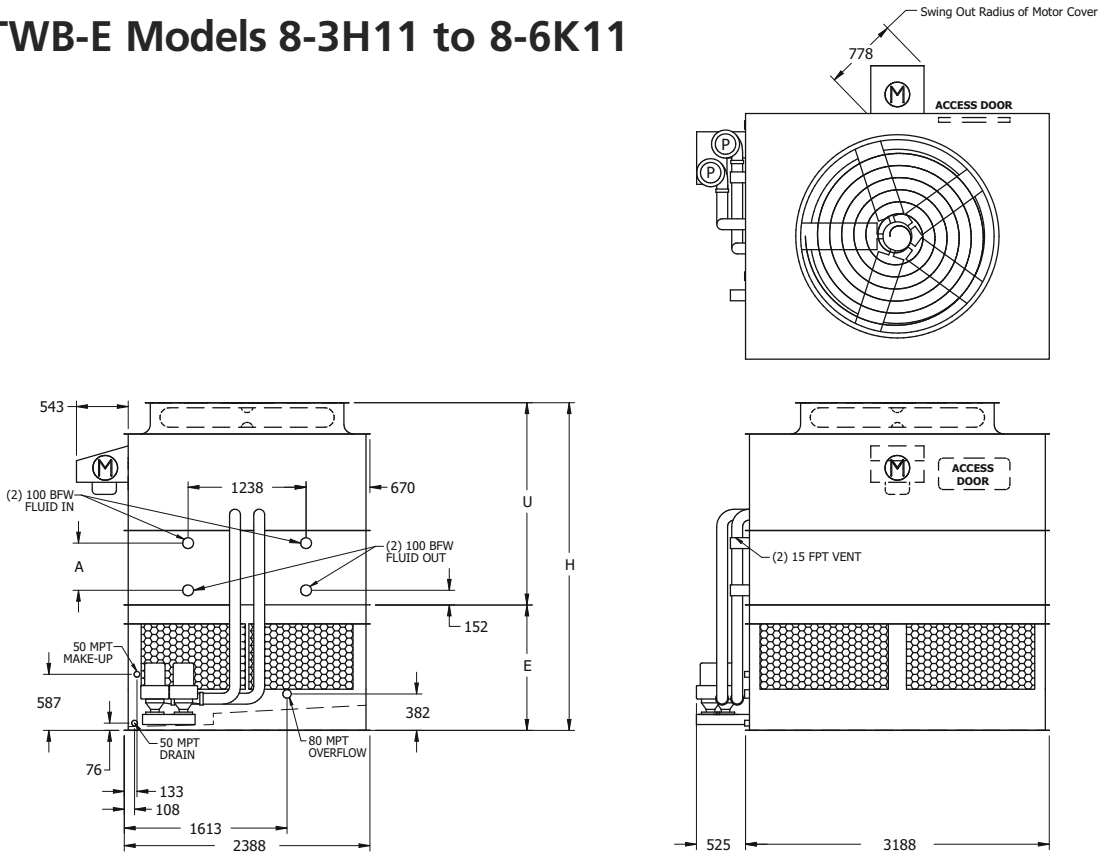
▲ Unit dimensions and coil connections may vary slightly from catalog. See factory certified prints for dimensions, quantity of coil connections, and piping configuration.

Coil connections are 4" bevel for welding (BFW)

eco-ATWB-E

Engineering Data & Dimensions

eco-ATWB-E Models 8-3H11 to 8-6K11



Notes: The number of coil connections doubles when the flow rate exceeds 56 l/s.
For additional Weights and Heights of optional **Low & Super Low Sound Fan** execution, see table on page 43.

eco-ATWB-E Model Number	Weights (kg)			Fans		Spray Pump	Coil Volume	Remote Sump △			Dimensions (mm) ▲			
	Shipping	Heaviest Section†	Operating	kW	m²/s	kW	(liters)	Liters Req'd*	Conn. Size (mm)	Operating Weight (kg)	Height H	Lower E	Upper U	Coil A
eco-ATWB-E 8-3H11	4870	4070	6850	5,5	18,6	(2) 1.1	666	1060	250	6170	3439	1318	2121	495
eco-ATWB-E 8-3I11	4880	4080	6860	7,5	20,5	(2) 1.1	666	1060	250	6180	3439	1318	2121	495
eco-ATWB-E 8-3J11	4930	4140	6910	11	23,1	(2) 1.1	666	1060	250	6230	3439	1318	2121	495
eco-ATWB-E 8-3K11	4960	4170	6940	15	25,1	(2) 1.1	666	1060	250	6260	3439	1318	2121	495
eco-ATWB-E 8-4H11	5670	4870	7850	5,5	18,1	(2) 1.1	871	1060	250	7170	3629	1318	2311	686
eco-ATWB-E 8-4I11	5680	4880	7860	7,5	19,9	(2) 1.1	871	1060	250	7180	3629	1318	2311	686
eco-ATWB-E 8-4J11	5730	4940	7920	11	22,5	(2) 1.1	871	1060	250	7240	3629	1318	2311	686
eco-ATWB-E 8-4K11	5760	4960	7940	15	24,3	(2) 1.1	871	1060	250	7260	3629	1318	2311	686
eco-ATWB-E 8-5H11	6530	5730	8920	5,5	17,5	(2) 1.1	1077	1060	250	8240	3820	1318	2502	876
eco-ATWB-E 8-5I11	6540	5740	8930	7,5	19,3	(2) 1.1	1077	1060	250	8250	3820	1318	2502	876
eco-ATWB-E 8-5J11	6590	5800	8980	11	21,8	(2) 1.1	1077	1060	250	8300	3820	1318	2502	876
eco-ATWB-E 8-5K11	6620	5830	9010	15	23,6	(2) 1.1	1077	1060	250	8330	3820	1318	2502	876
eco-ATWB-E 8-6H11	7370	6570	9960	5,5	17,0	(2) 1.1	1282	1060	250	9280	4010	1318	2692	1067
eco-ATWB-E 8-6I11	7380	6580	9970	7,5	18,7	(2) 1.1	1282	1060	250	9290	4010	1318	2692	1067
eco-ATWB-E 8-6J11	7430	6640	10030	11	21,1	(2) 1.1	1282	1060	250	9350	4010	1318	2692	1067
eco-ATWB-E 8-6K11	7460	6660	10050	15	22,9	(2) 1.1	1282	1060	250	9370	4010	1318	2692	1067

The motors are shipped loose for field mounting

† Heaviest section is the coil / fan section

* Liters shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (300mm would normally be sufficient).

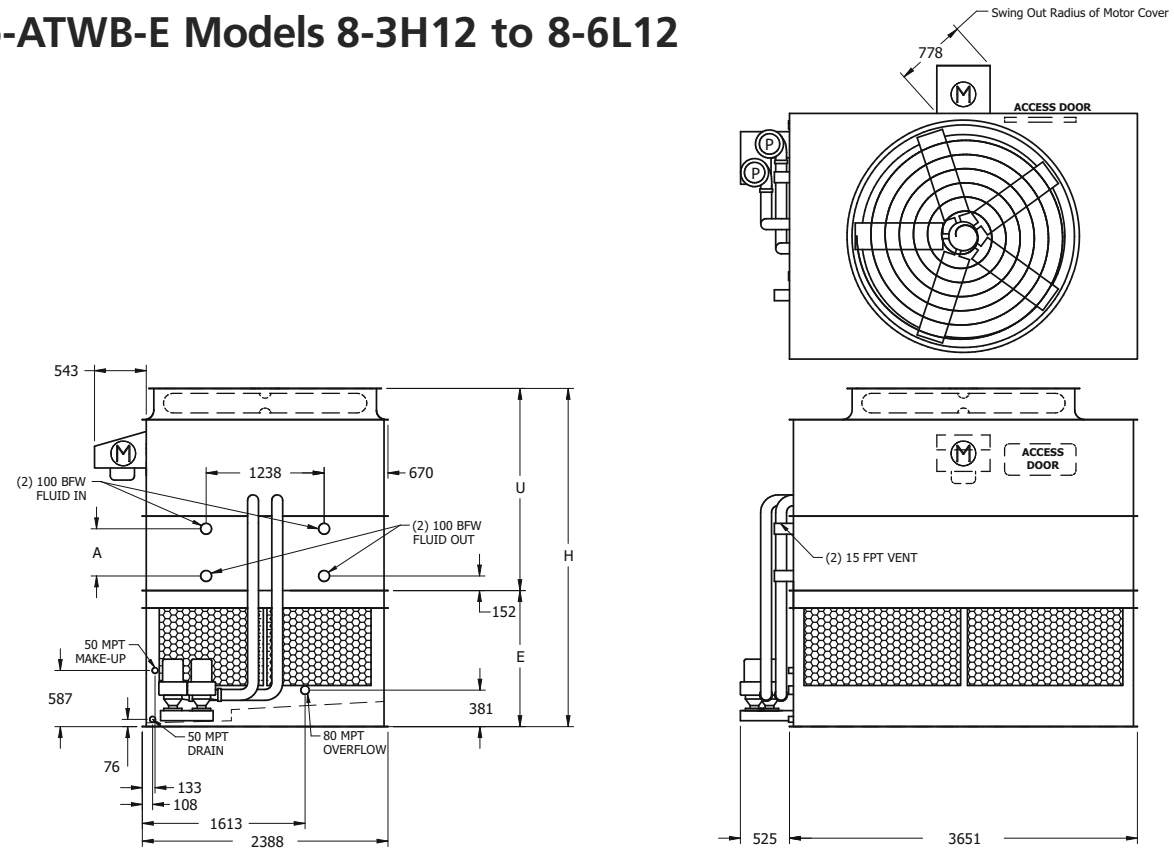
△ When a remote sump arrangement is selected, the spray pump, suction strainer and associated piping are omitted; the unit is provided with an oversized outlet to facilitate drainage to the remote sump.

▲ Unit dimensions and coil connections may vary slightly from catalog. See factory certified prints for dimensions, quantity of coil connections, and piping configuration.

Coil connections are 4" bevel for welding (BFW)

ENGINEERING

eco-ATWB-E Models 8-3H12 to 8-6L12



Notes: The number of coil connections doubles when the flow rate exceeds 56 l/s.
For additional Weights and Heights of optional **Low & Super Low Sound Fan** execution, see table on page 43.

eco-ATWB-E Model Number	Weights (kg)			Fans		Spray Pump	Coil Volume (liters)	Remote Sump △			Dimensions (mm) ▲			
	Shipping	Heaviest Section†	Operating	kW	m²/s	kW		Liters Req'd*	Conn. Size (mm)	Operating Weight (kg)	Height H	Lower E	Upper U	Coil A
eco-ATWB-E 8-3H12	5300	4420	7590	5,5	20,4	(2) 1.1	756	1210	250	6830	3439	1318	2121	495
eco-ATWB-E 8-3I12	5310	4430	7600	7,5	22,4	(2) 1.1	756	1210	250	6840	3439	1318	2121	495
eco-ATWB-E 8-3J12	5360	4480	7660	11	25,5	(2) 1.1	756	1210	250	6890	3439	1318	2121	495
eco-ATWB-E 8-3K12	5390	4510	7680	15	27,7	(2) 1.1	756	1210	250	6920	3439	1318	2121	495
eco-ATWB-E 8-4H12	6230	5360	8760	5,5	19,8	(2) 1.1	991	1210	250	8000	3629	1318	2311	686
eco-ATWB-E 8-4I12	6240	5360	8770	7,5	21,8	(2) 1.1	991	1210	250	8010	3629	1318	2311	686
eco-ATWB-E 8-4J12	6300	5420	8830	11	24,8	(2) 1.1	991	1210	250	8070	3629	1318	2311	686
eco-ATWB-E 8-4K12	6320	5450	8860	15	26,9	(2) 1.1	991	1210	250	8090	3629	1318	2311	686
eco-ATWB-E 8-4L12	6340	5460	8870	18,5	28,6	(2) 1.1	991	1210	250	8110	3629	1318	2311	686
eco-ATWB-E 8-5H12	7170	6290	9930	5,5	19,2	(2) 1.1	1227	1210	250	9170	3820	1318	2502	876
eco-ATWB-E 8-5I12	7170	6300	9940	7,5	21,1	(2) 1.1	1227	1210	250	9180	3820	1318	2502	876
eco-ATWB-E 8-5J12	7230	6350	10000	11	24,0	(2) 1.1	1227	1210	250	9230	3820	1318	2502	876
eco-ATWB-E 8-5K12	7260	6380	10020	15	26,0	(2) 1.1	1227	1210	250	9260	3820	1318	2502	876
eco-ATWB-E 8-5L12	7270	6390	10040	18,5	27,7	(2) 1.1	1227	1210	250	9270	3820	1318	2502	876
eco-ATWB-E 8-6H12	8130	7260	11140	5,5	18,6	(2) 1.1	1462	1210	250	10370	4010	1318	2692	1067
eco-ATWB-E 8-6I12	8140	7260	11140	7,5	20,5	(2) 1.1	1462	1210	250	10380	4010	1318	2692	1067
eco-ATWB-E 8-6J12	8200	7320	11200	11	23,3	(2) 1.1	1462	1210	250	10440	4010	1318	2692	1067
eco-ATWB-E 8-6K12	8220	7350	11230	15	25,2	(2) 1.1	1462	1210	250	10460	4010	1318	2692	1067
eco-ATWB-E 8-6L12	8240	7360	11240	18,5	26,9	(2) 1.1	1462	1210	250	10480	4010	1318	2692	1067

The motors are shipped loose for field mounting

† Heaviest section is the coil / fan section

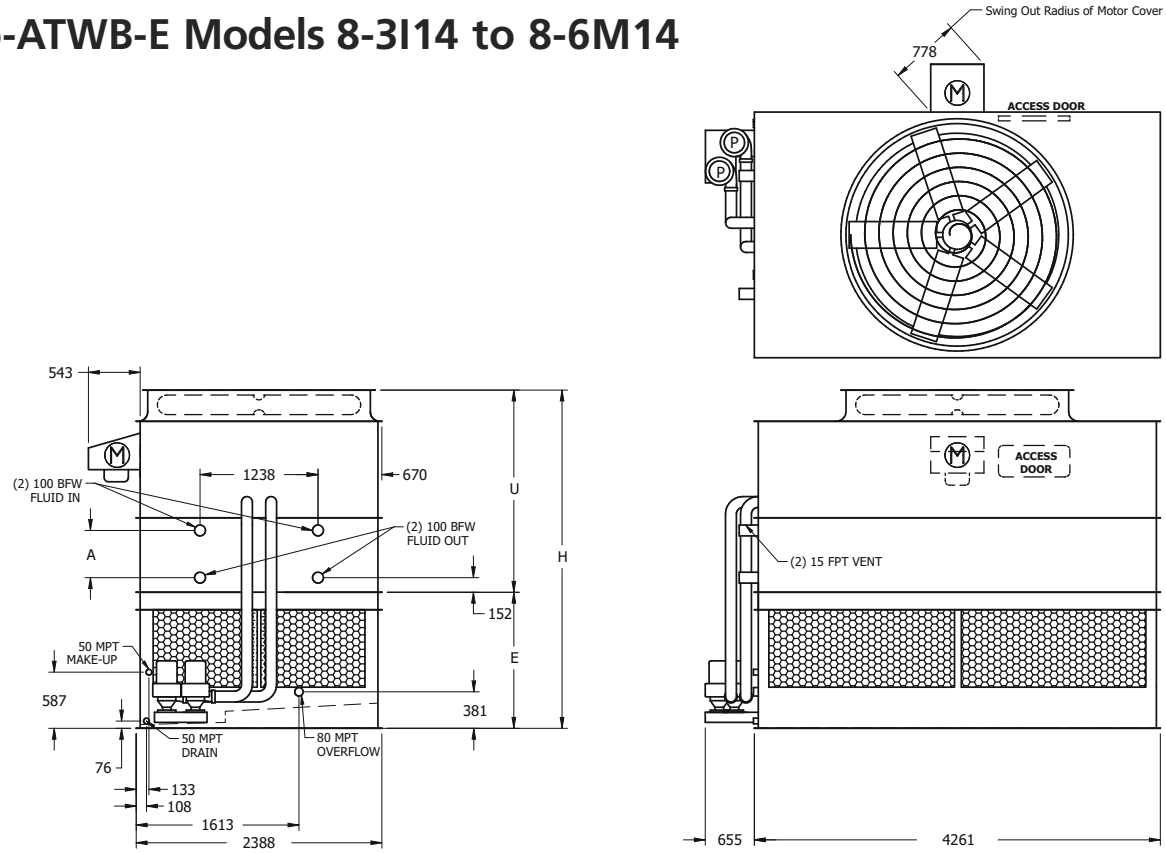
* Liters shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (300mm would normally be sufficient).

△ When a remote sump arrangement is selected, the spray pump, suction strainer and associated piping are omitted; the unit is provided with an oversized outlet to facilitate drainage to the remote sump.

▲ Unit dimensions and coil connections may vary slightly from catalog. See factory certified prints for dimensions, quantity of coil connections, and piping configuration.

Coil connections are 4" bevel for welding (BFW)

eco-ATWB-E Models 8-3I14 to 8-6M14



Notes: The number of coil connections doubles when the flow rate exceeds 56 l/s.
For additional Weights and Heights of optional **Low & Super Low Sound Fan** execution, see table on page 43.

eco-ATWB-E Model Number	Weights (kg)			Fans		Spray Pump	Coil Volume	Remote Sump △			Dimensions (mm) ▲			
	Shipping	Heaviest Section†	Operating	kW	m²/s	kW	(liters)	Liters Req'd*	Conn. Size (mm)	Operating Weight (kg)	Height H	Lower E	Upper U	Coil A
eco-ATWB-E 8-3I14	6040	5040	8720	7,5	24,9	(2) 1.5	876	1365	250	7820	3550	1429	2121	495
eco-ATWB-E 8-3J14	6100	5090	8770	11	28,5	(2) 1.5	876	1365	250	7870	3550	1429	2121	495
eco-ATWB-E 8-3K14	6130	5120	8800	15	30,9	(2) 1.5	876	1365	250	7900	3550	1429	2121	495
eco-ATWB-E 8-3L14	6140	5140	8810	18,5	32,9	(2) 1.5	876	1365	250	7910	3550	1429	2121	495
eco-ATWB-E 8-4I14	7130	6120	10070	7,5	24,1	(2) 1.5	1152	1365	250	9170	3740	1429	2311	686
eco-ATWB-E 8-4J14	7180	6180	10130	11	27,6	(2) 1.5	1152	1365	250	9230	3740	1429	2311	686
eco-ATWB-E 8-4K14	7210	6210	10150	15	30,0	(2) 1.5	1152	1365	250	9260	3740	1429	2311	686
eco-ATWB-E 8-4L14	7220	6220	10170	18,5	31,9	(2) 1.5	1152	1365	250	9270	3740	1429	2311	686
eco-ATWB-E 8-4M14	7250	6240	10190	22	33,6	(2) 1.5	1152	1365	250	9290	3740	1429	2311	686
eco-ATWB-E 8-5I14	8210	7200	11430	7,5	23,4	(2) 1.5	1427	1365	250	10530	3931	1429	2502	876
eco-ATWB-E 8-5J14	8260	7260	11480	11	26,8	(2) 1.5	1427	1365	250	10590	3931	1429	2502	876
eco-ATWB-E 8-5K14	8290	7290	11510	15	29,1	(2) 1.5	1427	1365	250	10610	3931	1429	2502	876
eco-ATWB-E 8-5L14	8300	7300	11520	18,5	31,0	(2) 1.5	1427	1365	250	10630	3931	1429	2502	876
eco-ATWB-E 8-5M14	8330	7320	11550	22	32,6	(2) 1.5	1427	1365	250	10650	3931	1429	2502	876
eco-ATWB-E 8-6I14	9330	8330	12830	7,5	22,7	(2) 1.5	1702	1365	250	11930	4121	1429	2692	1067
eco-ATWB-E 8-6J14	9390	8380	12880	11	26,0	(2) 1.5	1702	1365	250	11990	4121	1429	2692	1067
eco-ATWB-E 8-6K14	9410	8410	12910	15	28,2	(2) 1.5	1702	1365	250	12010	4121	1429	2692	1067
eco-ATWB-E 8-6L14	9430	8420	12930	18,5	30,0	(2) 1.5	1702	1365	250	12030	4121	1429	2692	1067
eco-ATWB-E 8-6M14	9450	8450	12950	22	31,6	(2) 1.5	1702	1365	250	12050	4121	1429	2692	1067

The motors are shipped loose for field mounting

† Heaviest section is the coil / fan section

* Liters shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (300mm would normally be sufficient).

△ When a remote sump arrangement is selected, the spray pump, suction strainer and associated piping are omitted; the unit is provided with an oversized outlet to facilitate drainage to the remote sump.

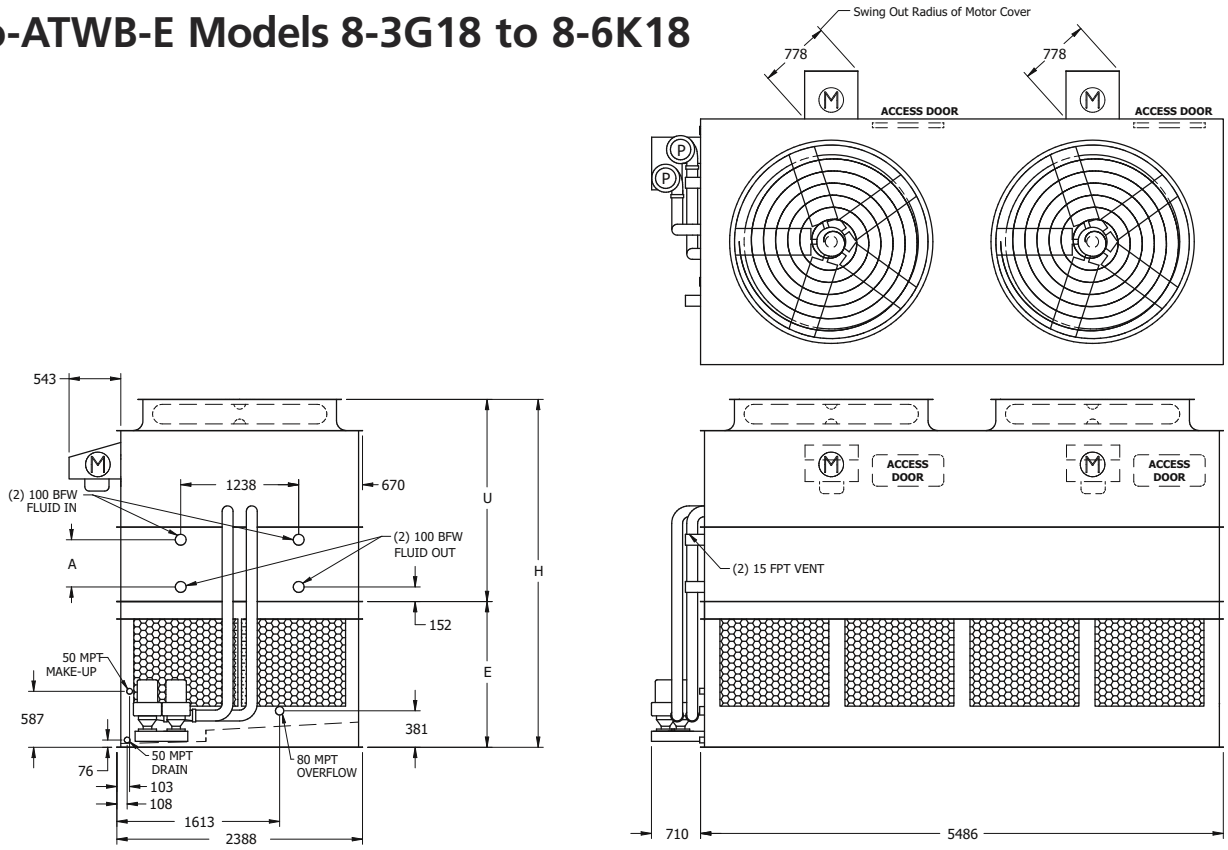
▲ Unit dimensions and coil connections may vary slightly from catalog. See factory certified prints for dimensions, quantity of coil connections, and piping configuration.

Coil connections are 4" bevel for welding (BFW)

Engineering Data & Dimensions

eco-ATWB-E

eco-ATWB-E Models 8-3G18 to 8-6K18



Notes: The number of coil connections doubles when the flow rate exceeds 56 l/s.
For additional Weights and Heights of optional **Low & Super Low Sound Fan** execution, see table on page 43.

eco-ATWB-E Model Number	Weights (kg)			Fans		Spray Pump	Coil Volume (liters)	Remote Sump △			Dimensions (mm) ▲			
	Shipping	Heaviest Section†	Operating	kW	m²/s	kW		Liters Req'd*	Conn. Size (mm)	Operating Weight (kg)	Height H	Lower E	Upper U	Coil A
eco-ATWB-E 8-3G18	7990	6660	11450	(2) 4	29,3	(2) 2.2	1117	1815	300	10330	3651	1530	2121	495
eco-ATWB-E 8-3H18	8040	6700	11490	(2) 5.5	33,6	(2) 2.2	1117	1815	300	10370	3651	1530	2121	495
eco-ATWB-E 8-3I18	8050	6720	11500	(2) 7.5	37,0	(2) 2.2	1117	1815	300	10380	3651	1530	2121	495
eco-ATWB-E 8-3J18	8170	6830	11620	(2) 11	41,4	(2) 2.2	1117	1815	300	10500	3651	1530	2121	495
eco-ATWB-E 8-4G18	9400	8070	13210	(2) 4	28,5	(2) 2.2	1472	1815	300	12090	3842	1530	2311	686
eco-ATWB-E 8-4H18	9450	8110	13260	(2) 5.5	32,6	(2) 2.2	1472	1815	300	12140	3842	1530	2311	686
eco-ATWB-E 8-4I18	9460	8130	13270	(2) 7.5	35,9	(2) 2.2	1472	1815	300	12150	3842	1530	2311	686
eco-ATWB-E 8-4J18	9580	8240	13380	(2) 11	40,2	(2) 2.2	1472	1815	300	12260	3842	1530	2311	686
eco-ATWB-E 8-4K18	9630	8300	13440	(2) 15	43,6	(2) 2.2	1472	1815	300	12320	3842	1530	2311	686
eco-ATWB-E 8-5G18	10790	9450	14950	(2) 4	27,6	(2) 2.2	1827	1815	300	13830	4032	1530	2502	876
eco-ATWB-E 8-5H18	10830	9500	14990	(2) 5.5	31,6	(2) 2.2	1827	1815	300	13870	4032	1530	2502	876
eco-ATWB-E 8-5I18	10850	9510	15010	(2) 7.5	34,8	(2) 2.2	1827	1815	300	13890	4032	1530	2502	876
eco-ATWB-E 8-5J18	10960	9630	15120	(2) 11	39,0	(2) 2.2	1827	1815	300	14000	4032	1530	2502	876
eco-ATWB-E 8-5K18	11020	9680	15170	(2) 15	42,3	(2) 2.2	1827	1815	300	14050	4032	1530	2502	876
eco-ATWB-E 8-6G18	12250	10910	16770	(2) 4	26,8	(2) 2.2	2183	1815	300	15650	4222	1530	2692	1067
eco-ATWB-E 8-6H18	12290	10960	16810	(2) 5.5	30,6	(2) 2.2	2183	1815	300	15690	4222	1530	2692	1067
eco-ATWB-E 8-6I18	12310	10970	16830	(2) 7.5	33,7	(2) 2.2	2183	1815	300	15710	4222	1530	2692	1067
eco-ATWB-E 8-6J18	12420	11090	16940	(2) 11	37,8	(2) 2.2	2183	1815	300	15820	4222	1530	2692	1067
eco-ATWB-E 8-6K18	12480	11140	16990	(2) 15	40,9	(2) 2.2	2183	1815	300	15870	4222	1530	2692	1067

The motors are shipped loose for field mounting

† Heaviest section is the coil / fan section

* Liters shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (300mm would normally be sufficient).

△ When a remote sump arrangement is selected, the spray pump, suction strainer and associated piping are omitted; the unit is provided with an oversized outlet to facilitate drainage to the remote sump.

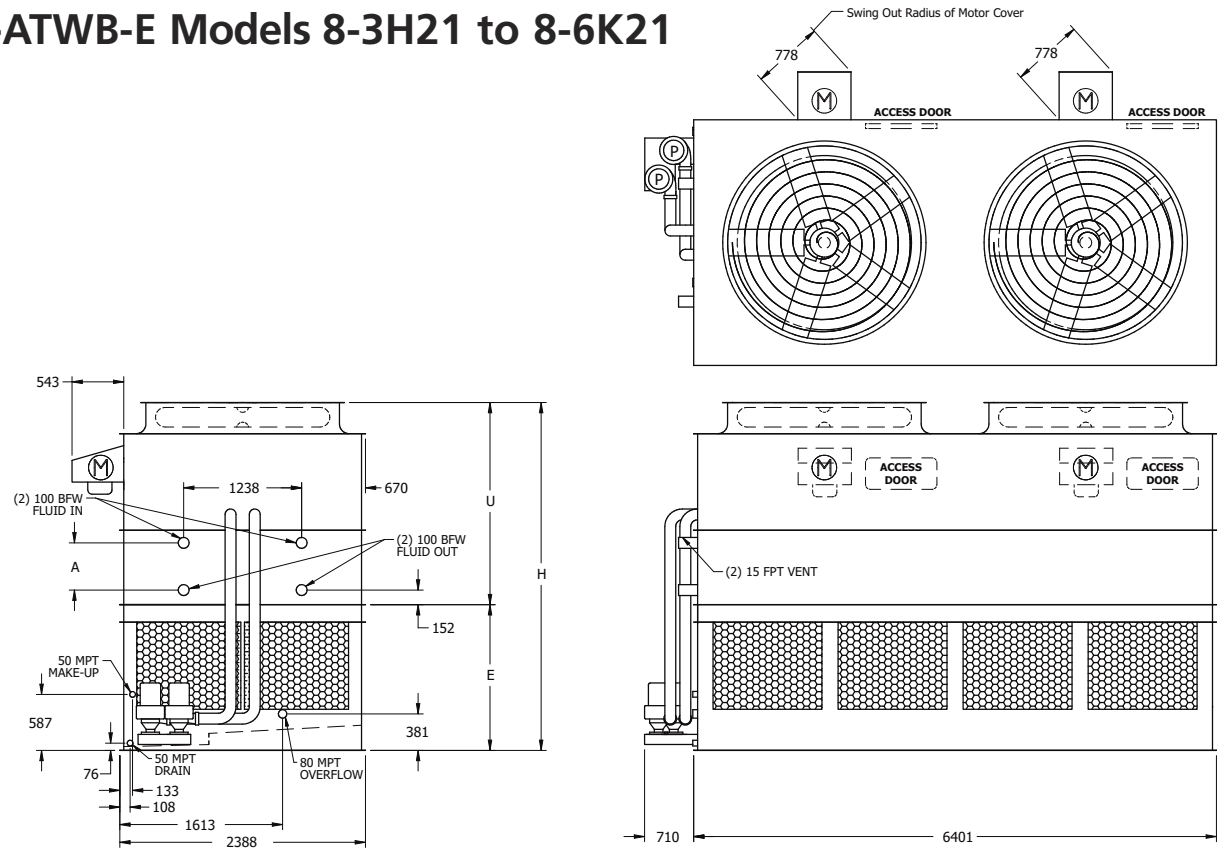
▲ Unit dimensions and coil connections may vary slightly from catalog. See factory certified prints for dimensions, quantity of coil connections, and piping configuration.

Coil connections are 4" bevel for welding (BFW)

eco-ATWB-E

Engineering Data & Dimensions

eco-ATWB-E Models 8-3H21 to 8-6K21



Notes: The number of coil connections doubles when the flow rate exceeds 56 l/s.
For additional Weights and Heights of optional **Low & Super Low Sound Fan** execution, see table on page 43.

eco-ATWB-E Model Number	Weights (kg)			Fans		Spray Pump	Coil Volume	Remote Sump △			Dimensions (mm) ▲			
	Shipping	Heaviest Section†	Operating	kW	m²/s	kW	(liters)	Liters Req'd*	Conn. Size (mm)	Operating Weight (kg)	Height H	Lower E	Upper U	Coil A
eco-ATWB-E 8-3H21	9160	7670	13230	(2) 5.5	37,3	(2) 2.2	1297	2120	300	11900	3651	1530	2121	495
eco-ATWB-E 8-3I21	9180	7690	13240	(2) 7.5	41,1	(2) 2.2	1297	2120	300	11920	3651	1530	2121	495
eco-ATWB-E 8-3J21	9290	7800	13350	(2) 11	46,4	(2) 2.2	1297	2120	300	12030	3651	1530	2121	495
eco-ATWB-E 8-3K21	9340	7860	13410	(2) 15	50,3	(2) 2.2	1297	2120	300	12080	3651	1530	2121	495
eco-ATWB-E 8-4H21	10800	9320	15290	(2) 5.5	36,2	(2) 2.2	1712	2120	300	13960	3841	1530	2311	686
eco-ATWB-E 8-4I21	10820	9330	15300	(2) 7.5	39,9	(2) 2.2	1712	2120	300	13980	3841	1530	2311	686
eco-ATWB-E 8-4J21	10930	9440	15410	(2) 11	45,1	(2) 2.2	1712	2120	300	14090	3841	1530	2311	686
eco-ATWB-E 8-4K21	10990	9500	15470	(2) 15	48,9	(2) 2.2	1712	2120	300	14140	3841	1530	2311	686
eco-ATWB-E 8-5H21	12410	10930	17310	(2) 5.5	35,2	(2) 2.2	2128	2120	300	15980	4032	1530	2502	876
eco-ATWB-E 8-5I21	12430	10940	17320	(2) 7.5	38,7	(2) 2.2	2128	2120	300	16000	4032	1530	2502	876
eco-ATWB-E 8-5J21	12540	11050	17440	(2) 11	43,7	(2) 2.2	2128	2120	300	16110	4032	1530	2502	876
eco-ATWB-E 8-5K21	12600	11110	17490	(2) 15	47,4	(2) 2.2	2128	2120	300	16170	4032	1530	2502	876
eco-ATWB-E 8-6H21	14090	12600	19400	(2) 5.5	34,1	(2) 2.2	2543	2120	300	18080	4222	1530	2692	1067
eco-ATWB-E 8-6I21	14110	12620	19420	(2) 7.5	37,5	(2) 2.2	2543	2120	300	18090	4222	1530	2692	1067
eco-ATWB-E 8-6J21	14220	12730	19530	(2) 11	42,4	(2) 2.2	2543	2120	300	18210	4222	1530	2692	1067
eco-ATWB-E 8-6K21	14270	12780	19590	(2) 15	45,9	(2) 2.2	2543	2120	300	18260	4222	1530	2692	1067

The motors are shipped loose for field mounting

† Heaviest section is the coil / fan section

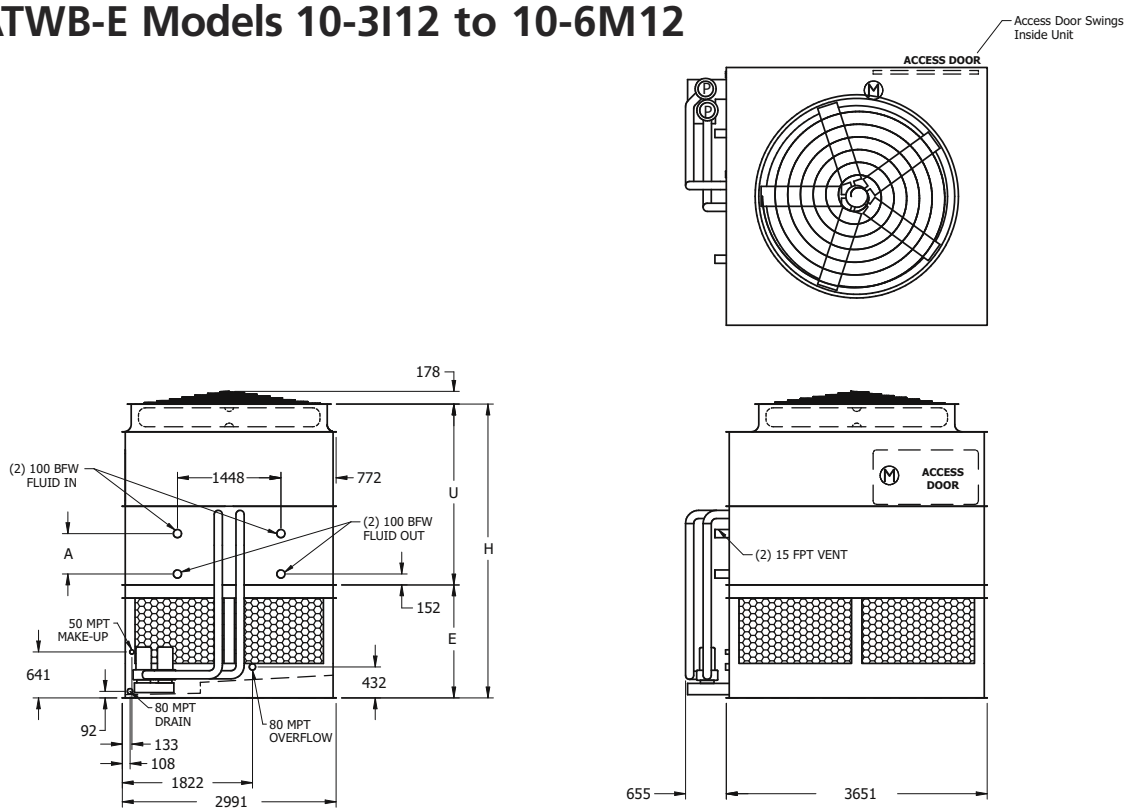
* Liters shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (300mm would normally be sufficient).

△ When a remote sump arrangement is selected, the spray pump, suction strainer and associated piping are omitted; the unit is provided with an oversized outlet to facilitate drainage to the remote sump.

▲ Unit dimensions and coil connections may vary slightly from catalog. See factory certified prints for dimensions, quantity of coil connections, and piping configuration.

Coil connections are 4" bevel for welding (BFW)

eco-ATWB-E Models 10-3I12 to 10-6M12



Notes: The number of coil connections doubles when the flow rate exceeds 56 l/s.
For additional Weights and Heights of optional **Low & Super Low Sound Fan** execution, see table on page 43.

eco-ATWB-E Model Number	Weights (kg)			Fans		Spray Pump	Coil Volume	Remote Sump △			Dimensions (mm) ▲			
	Shipping	Heaviest Section†	Operating	kW	m²/s	kW	(liters)	Liters Req'd*	Conn. Size (mm)	Operating Weight (kg)	Height H	Lower E	Upper U	Coil A
eco-ATWB-E 10-3I12	6790	5560	10200	7,5	26,2	(2) 1.5	959	1590	300	8550	4111	1581	2530	565
eco-ATWB-E 10-3J12	6850	5620	10260	11	30,0	(2) 1.5	959	1590	300	8610	4111	1581	2530	565
eco-ATWB-E 10-3K12	6880	5640	10290	15	32,7	(2) 1.5	959	1590	300	8640	4111	1581	2530	565
eco-ATWB-E 10-3L12	6890	5660	10300	18,5	34,8	(2) 1.5	959	1590	300	8650	4111	1581	2530	565
eco-ATWB-E 10-3M12	6920	5680	10320	22	36,6	(2) 1.5	959	1590	300	8680	4111	1581	2530	565
eco-ATWB-E 10-4I12	7990	6750	11690	7,5	25,4	(2) 1.5	1258	1590	300	10040	4327	1581	2746	781
eco-ATWB-E 10-4J12	8040	6810	11750	11	29,1	(2) 1.5	1258	1590	300	10100	4327	1581	2746	781
eco-ATWB-E 10-4K12	8070	6830	11780	15	31,7	(2) 1.5	1258	1590	300	10130	4327	1581	2746	781
eco-ATWB-E 10-4L12	8080	6850	11790	18,5	33,8	(2) 1.5	1258	1590	300	10140	4327	1581	2746	781
eco-ATWB-E 10-4M12	8110	6870	11810	22	35,5	(2) 1.5	1258	1590	300	10170	4327	1581	2746	781
eco-ATWB-E 10-5I12	9130	7890	13130	7,5	24,6	(2) 1.5	1557	1590	300	11490	4543	1581	2962	997
eco-ATWB-E 10-5J12	9190	7950	13190	11	28,2	(2) 1.5	1557	1590	300	11550	4543	1581	2962	997
eco-ATWB-E 10-5K12	9210	7980	13220	15	30,8	(2) 1.5	1557	1590	300	11570	4543	1581	2962	997
eco-ATWB-E 10-5L12	9230	7990	13230	18,5	32,8	(2) 1.5	1557	1590	300	11590	4543	1581	2962	997
eco-ATWB-E 10-5M12	9250	8010	13260	22	34,5	(2) 1.5	1557	1590	300	11610	4543	1581	2962	997
eco-ATWB-E 10-6I12	10340	9100	14640	7,5	23,9	(2) 1.5	1855	1590	300	12990	4759	1581	3178	1213
eco-ATWB-E 10-6J12	10400	9160	14700	11	27,3	(2) 1.5	1855	1590	300	13050	4759	1581	3178	1213
eco-ATWB-E 10-6K12	10420	9190	14720	15	29,8	(2) 1.5	1855	1590	300	13080	4759	1581	3178	1213
eco-ATWB-E 10-6L12	10440	9200	14740	18,5	31,7	(2) 1.5	1855	1590	300	13090	4759	1581	3178	1213
eco-ATWB-E 10-6M12	10460	9220	14760	22	33,4	(2) 1.5	1855	1590	300	13110	4759	1581	3178	1213

† Heaviest section is the coil / fan section

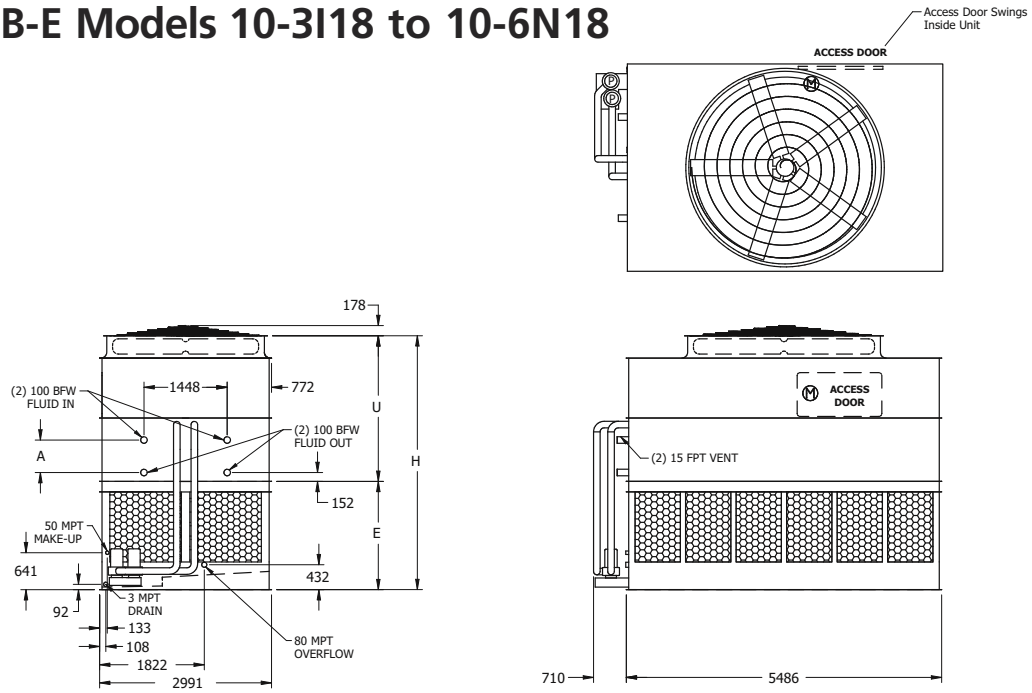
* Liters shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (300mm would normally be sufficient).

△ When a remote sump arrangement is selected, the spray pump, suction strainer and associated piping are omitted; the unit is provided with an oversized outlet to facilitate drainage to the remote sump.

▲ Unit dimensions and coil connections may vary slightly from catalog. See factory certified prints for dimensions, quantity of coil connections, and piping configuration.

Coil connections are 4" bevel for welding (BFW)

eco-ATWB-E Models 10-3I18 to 10-6N18



Notes: The number of coil connections doubles when the flow rate exceeds 56 l/s.
For additional Weights and Heights of optional **Low & Super Low Sound Fan** execution, see table on page 43.

eco-ATWB-E Model Number	Weights (kg)			Fans		Spray Pump	Coil Volume	Remote Sump △			Dimensions (mm) ▲			
	Shipping	Heaviest Section†	Operating	kW	m²/s	kW	(liters)	Liters Req'd*	Conn. Size (mm)	Operating Weight (kg)	Height H	Lower E	Upper U	Coil A
eco-ATWB-E 10-3I18	9760	7980	14870	7,5	34,4	(2) 2.2	1417	2385	300	12450	4111	1581	2530	565
eco-ATWB-E 10-3J18	9810	8040	14930	11	39,3	(2) 2.2	1417	2385	300	12500	4111	1581	2530	565
eco-ATWB-E 10-3K18	9840	8060	14960	15	43,3	(2) 2.2	1417	2385	300	12530	4111	1581	2530	565
eco-ATWB-E 10-3L18	9860	8080	14970	18,5	46,6	(2) 2.2	1417	2385	300	12550	4111	1581	2530	565
eco-ATWB-E 10-3M18	9880	8100	15000	22	49,1	(2) 2.2	1417	2385	300	12570	4111	1581	2530	565
eco-ATWB-E 10-3N18	9950	8170	15070	30	53,2	(2) 2.2	1417	2385	300	12640	4111	1581	2530	565
eco-ATWB-E 10-4I18	11540	9760	17100	7,5	33,4	(2) 2.2	1868	2385	300	14680	4327	1581	2746	781
eco-ATWB-E 10-4J18	11600	9820	17160	11	38,2	(2) 2.2	1868	2385	300	14740	4327	1581	2746	781
eco-ATWB-E 10-4K18	11620	9840	17190	15	42,0	(2) 2.2	1868	2385	300	14760	4327	1581	2746	781
eco-ATWB-E 10-4L18	11640	9860	17200	18,5	45,3	(2) 2.2	1868	2385	300	14780	4327	1581	2746	781
eco-ATWB-E 10-4M18	11660	9880	17230	22	47,7	(2) 2.2	1868	2385	300	14800	4327	1581	2746	781
eco-ATWB-E 10-4N18	11730	9950	17300	30	51,7	(2) 2.2	1868	2385	300	14870	4327	1581	2746	781
eco-ATWB-E 10-5I18	13270	11490	19290	7,5	32,4	(2) 2.2	2320	2385	300	16870	4543	1581	2962	997
eco-ATWB-E 10-5J18	13330	11550	19350	11	37,1	(2) 2.2	2320	2385	300	16930	4543	1581	2962	997
eco-ATWB-E 10-5K18	13360	11580	19380	15	40,8	(2) 2.2	2320	2385	300	16950	4543	1581	2962	997
eco-ATWB-E 10-5L18	13370	11590	19390	18,5	43,9	(2) 2.2	2320	2385	300	16970	4543	1581	2962	997
eco-ATWB-E 10-5M18	13400	11620	19420	22	46,3	(2) 2.2	2320	2385	300	16990	4543	1581	2962	997
eco-ATWB-E 10-5N18	13470	11690	19490	30	50,1	(2) 2.2	2320	2385	300	17060	4543	1581	2962	997
eco-ATWB-E 10-6I18	15080	13300	21550	7,5	31,4	(2) 2.2	2771	2385	300	19120	4759	1581	3178	1213
eco-ATWB-E 10-6J18	15140	13360	21610	11	35,9	(2) 2.2	2771	2385	300	19180	4759	1581	3178	1213
eco-ATWB-E 10-6K18	15170	13390	21640	15	39,5	(2) 2.2	2771	2385	300	19210	4759	1581	3178	1213
eco-ATWB-E 10-6L18	15180	13400	21650	18,5	42,6	(2) 2.2	2771	2385	300	19220	4759	1581	3178	1213
eco-ATWB-E 10-6M18	15200	13430	21670	22	44,8	(2) 2.2	2771	2385	300	19250	4759	1581	3178	1213
eco-ATWB-E 10-6N18	15280	13500	21750	30	48,6	(2) 2.2	2771	2385	300	19320	4759	1581	3178	1213

† Heaviest section is the coil / fan section

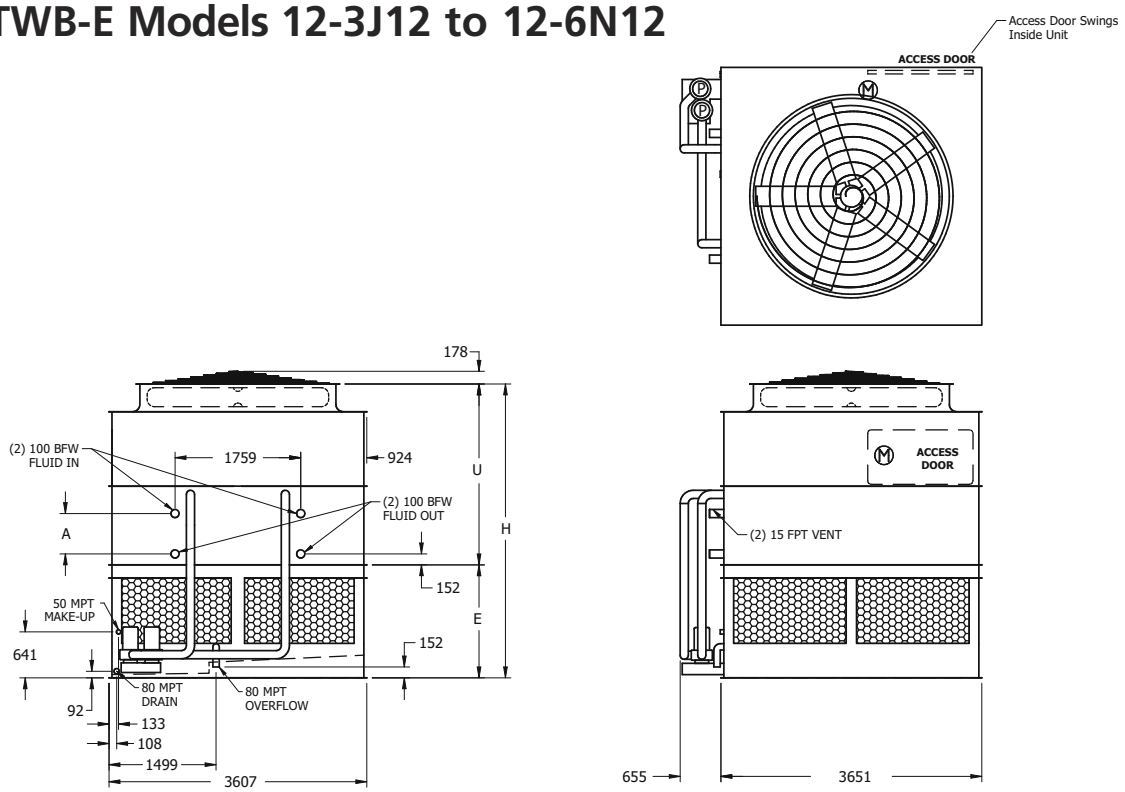
* Liters shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (300mm would normally be sufficient).

△ When a remote sump arrangement is selected, the spray pump, suction strainer and associated piping are omitted; the unit is provided with an oversized outlet to facilitate drainage to the remote sump.

▲ Unit dimensions and coil connections may vary slightly from catalog. See factory certified prints for dimensions, quantity of coil connections, and piping configuration.

Coil connections are 4" bevel for welding (BFW)

eco-ATWB-E Models 12-3J12 to 12-6N12



Notes: The number of coil connections doubles when the flow rate exceeds 56 l/s.
For additional Weights and Heights of optional **Low & Super Low Sound Fan** execution, see table on page 43.

eco-ATWB-E Model Number	Weights (kg)			Fans		Spray Pump	Coil Volume	Remote Sump △			Dimensions (mm) ▲			
	Shipping	Heaviest Section†	Operating	kW	m²/s	kW	(liters)	Liters Req'd*	Conn. Size (mm)	Operating Weight (kg)	Height H	Lower E	Upper U	Coil A
eco-ATWB-E 12-3J12	7900	6590	11810	11	34,1	(2) 1.5	1179	1855	300	9990	4111	1581	2530	565
eco-ATWB-E 12-3K12	7930	6620	11840	15	37,5	(2) 1.5	1179	1855	300	10020	4111	1581	2530	565
eco-ATWB-E 12-3L12	7940	6630	11850	18,5	40,0	(2) 1.5	1179	1855	300	10030	4111	1581	2530	565
eco-ATWB-E 12-3M12	7960	6660	11870	22	42,1	(2) 1.5	1179	1855	300	10060	4111	1581	2530	565
eco-ATWB-E 12-4J12	9370	8060	13650	11	33,1	(2) 1.5	1548	1855	300	11830	4327	1581	2746	781
eco-ATWB-E 12-4K12	9390	8080	13680	15	36,4	(2) 1.5	1548	1855	300	11860	4327	1581	2746	781
eco-ATWB-E 12-4L12	9410	8100	13690	18,5	38,8	(2) 1.5	1548	1855	300	11870	4327	1581	2746	781
eco-ATWB-E 12-4M12	9430	8120	13710	22	40,8	(2) 1.5	1548	1855	300	11890	4327	1581	2746	781
eco-ATWB-E 12-4N12	9500	8190	13780	30	44,3	(2) 1.5	1548	1855	300	11960	4327	1581	2746	781
eco-ATWB-E 12-5K12	10780	9480	15430	15	35,3	(2) 1.5	1917	1855	300	13620	4543	1581	2962	997
eco-ATWB-E 12-5L12	10800	9490	15450	18,5	37,6	(2) 1.5	1917	1855	300	13630	4543	1581	2962	997
eco-ATWB-E 12-5M12	10820	9510	15470	22	39,6	(2) 1.5	1917	1855	300	13650	4543	1581	2962	997
eco-ATWB-E 12-5N12	10890	9580	15540	30	42,9	(2) 1.5	1917	1855	300	13720	4543	1581	2962	997
eco-ATWB-E 12-6L12	12270	10960	17290	18,5	36,5	(2) 1.5	2286	1855	300	15470	4759	1581	3178	1213
eco-ATWB-E 12-6M12	12290	10990	17310	22	38,4	(2) 1.5	2286	1855	300	15490	4759	1581	3178	1213
eco-ATWB-E 12-6N12	12370	11060	17380	30	41,6	(2) 1.5	2286	1855	300	15570	4759	1581	3178	1213

† Heaviest section is the coil / fan section

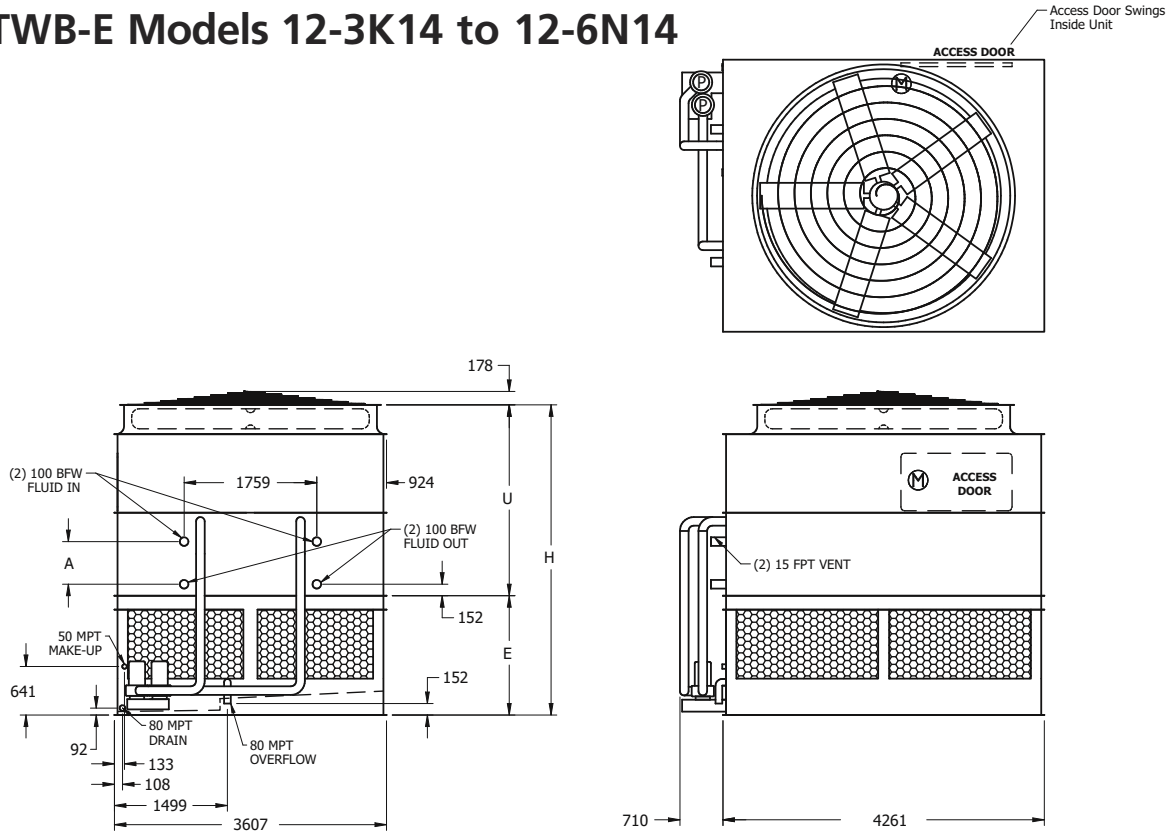
* Liters shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (300mm would normally be sufficient).

△ When a remote sump arrangement is selected, the spray pump, suction strainer and associated piping are omitted; the unit is provided with an oversized outlet to facilitate drainage to the remote sump.

▲ Unit dimensions and coil connections may vary slightly from catalog. See factory certified prints for dimensions, quantity of coil connections, and piping configuration.

Coil connections are 4" bevel for welding (BFW)

eco-ATWB-E Models 12-3K14 to 12-6N14



Notes: The number of coil connections doubles when the flow rate exceeds 56 l/s.
For additional Weights and Heights of optional **Low & Super Low Sound Fan** execution, see table on page 43.

eco-ATWB-E Model Number	Weights (kg)			Fans		Spray Pump	Coil Volume	Remote Sump △			Dimensions (mm) ▲			
	Shipping	Heaviest Section†	Operating	kW	m²/s	kW	(liters)	Liters Req'd*	Conn. Size (mm)	Operating Weight (kg)	Height H	Lower E	Upper U	Coil A
eco-ATWB-E 12-3K14	9040	7530	13630	15	41,6	(2) 2.2	1368	2160	300	11500	4264	1734	2530	565
eco-ATWB-E 12-3L14	9060	7540	13650	18,5	44,7	(2) 2.2	1368	2160	300	11510	4264	1734	2530	565
eco-ATWB-E 12-3M14	9080	7570	13670	22	47,0	(2) 2.2	1368	2160	300	11530	4264	1734	2530	565
eco-ATWB-E 12-3N14	9150	7640	13740	30	51,0	(2) 2.2	1368	2160	300	11610	4264	1734	2530	565
eco-ATWB-E 12-4K14	10750	9240	15770	15	40,4	(2) 2.2	1799	2160	300	13640	4480	1734	2746	781
eco-ATWB-E 12-4L14	10770	9250	15790	18,5	43,4	(2) 2.2	1799	2160	300	13650	4480	1734	2746	781
eco-ATWB-E 12-4M14	10790	9270	15810	22	45,6	(2) 2.2	1799	2160	300	13670	4480	1734	2746	781
eco-ATWB-E 12-4N14	10860	9350	15880	30	49,5	(2) 2.2	1799	2160	300	13750	4480	1734	2746	781
eco-ATWB-E 12-5L14	12370	10860	17820	18,5	42,1	(2) 2.2	2231	2160	300	15680	4696	1734	2962	997
eco-ATWB-E 12-5M14	12390	10880	17840	22	44,3	(2) 2.2	2231	2160	300	15710	4696	1734	2962	997
eco-ATWB-E 12-5N14	12460	10950	17920	30	48,0	(2) 2.2	2231	2160	300	15780	4696	1734	2962	997
eco-ATWB-E 12-6L14	14220	12710	20100	18,5	40,8	(2) 2.2	2662	2160	300	17970	4912	1734	3178	1213
eco-ATWB-E 12-6M14	14240	12730	20130	22	42,9	(2) 2.2	2662	2160	300	17990	4912	1734	3178	1213
eco-ATWB-E 12-6N14	14320	12800	20200	30	46,5	(2) 2.2	2662	2160	300	18060	4912	1734	3178	1213

† Heaviest section is the coil / fan section

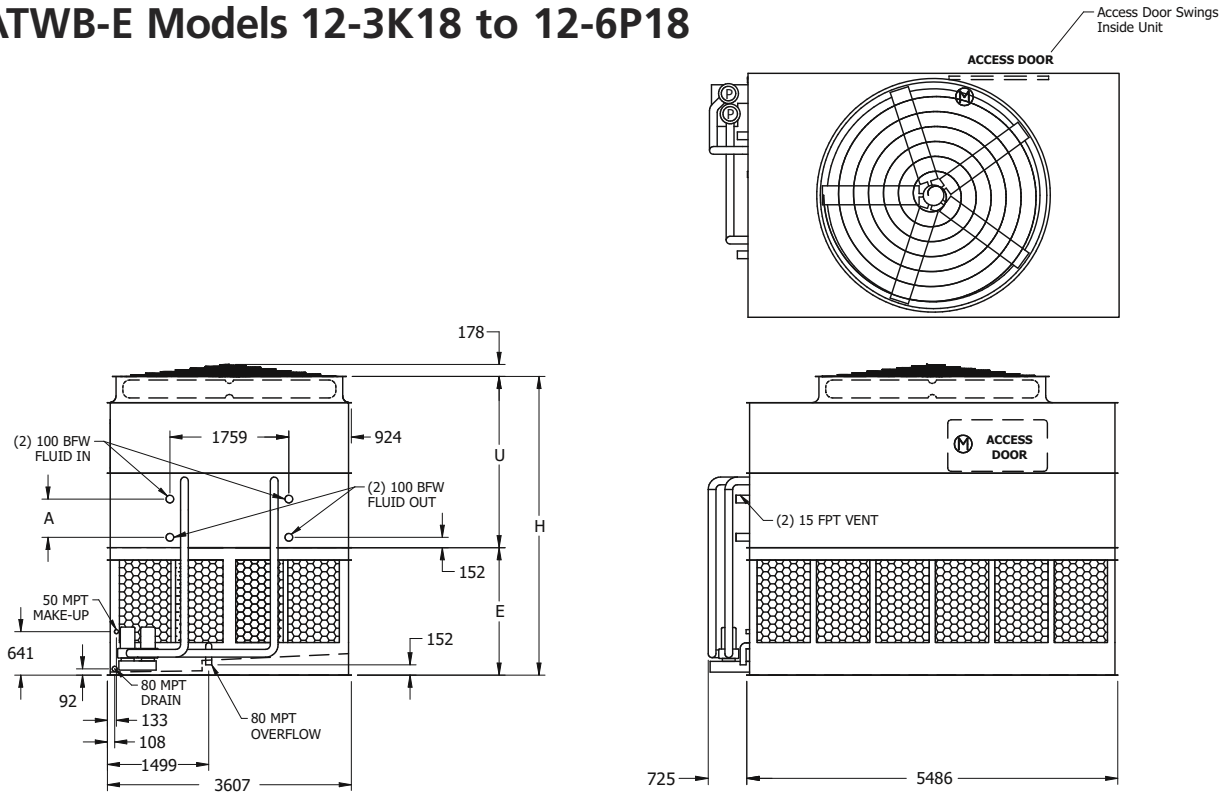
* Liters shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (300mm would normally be sufficient).

△ When a remote sump arrangement is selected, the spray pump, suction strainer and associated piping are omitted; the unit is provided with an oversized outlet to facilitate drainage to the remote sump.

▲ Unit dimensions and coil connections may vary slightly from catalog. See factory certified prints for dimensions, quantity of coil connections, and piping configuration.

Coil connections are 4" bevel for welding (BFW)

eco-ATWB-E Models 12-3K18 to 12-6P18



Notes: The number of coil connections doubles when the flow rate exceeds 56 l/s.
For additional Weights and Heights of optional **Low & Super Low Sound Fan** execution, see table on page 43.

eco-ATWB-E Model Number	Weights (kg)			Fans		Spray Pump	Coil Volume	Remote Sump △			Dimensions (mm) ▲			
	Shipping	Heaviest Section†	Operating	kW	m²/s	kW	(liters)	Liters Req'd*	Conn. Size (mm)	Operating Weight (kg)	Height H	Lower E	Upper U	Coil A
eco-ATWB-E 12-3K18	11410	9440	17280	15	50,8	(2) 4	1744	2725	300	14510	4416	1886	2530	565
eco-ATWB-E 12-3L18	11430	9460	17300	18,5	54,7	(2) 4	1744	2725	300	14520	4416	1886	2530	565
eco-ATWB-E 12-3M18	11450	9480	17320	22	58,1	(2) 4	1744	2725	300	14540	4416	1886	2530	565
eco-ATWB-E 12-3N18	11520	9550	17390	30	63,1	(2) 4	1744	2725	300	14620	4416	1886	2530	565
eco-ATWB-E 12-4K18	13600	11630	20030	15	49,3	(2) 4	2302	2725	300	17250	4632	1886	2746	781
eco-ATWB-E 12-4L18	13610	11640	20040	18,5	53,1	(2) 4	2302	2725	300	17260	4632	1886	2746	781
eco-ATWB-E 12-4M18	13640	11670	20060	22	56,4	(2) 4	2302	2725	300	17290	4632	1886	2746	781
eco-ATWB-E 12-4N18	13710	11740	20140	30	61,2	(2) 4	2302	2725	300	17360	4632	1886	2746	781
eco-ATWB-E 12-4O18	13710	11740	20140	37	65,2	(2) 4	2302	2725	300	17360	4632	1886	2746	781
eco-ATWB-E 12-5L18	15730	13760	22710	18,5	51,5	(2) 4	2859	2725	300	19930	4848	1886	2962	997
eco-ATWB-E 12-5M18	15750	13780	22730	22	54,7	(2) 4	2859	2725	300	19950	4848	1886	2962	997
eco-ATWB-E 12-5N18	15820	13850	22800	30	59,4	(2) 4	2859	2725	300	20030	4848	1886	2962	997
eco-ATWB-E 12-5O18	15830	13860	22810	37	63,2	(2) 4	2859	2725	300	20030	4848	1886	2962	997
eco-ATWB-E 12-6M18	17880	15910	25420	22	53,0	(2) 4	3416	2725	300	22650	5064	1886	3178	1213
eco-ATWB-E 12-6N18	17960	15990	25500	30	57,6	(2) 4	3416	2725	300	22720	5064	1886	3178	1213
eco-ATWB-E 12-6O18	17960	15990	25500	37	61,3	(2) 4	3416	2725	300	22720	5064	1886	3178	1213
eco-ATWB-E 12-6P18	18050	16080	25590	45	64,5	(2) 4	3416	2725	300	22810	5064	1886	3178	1213

† Heaviest section is the coil / fan section

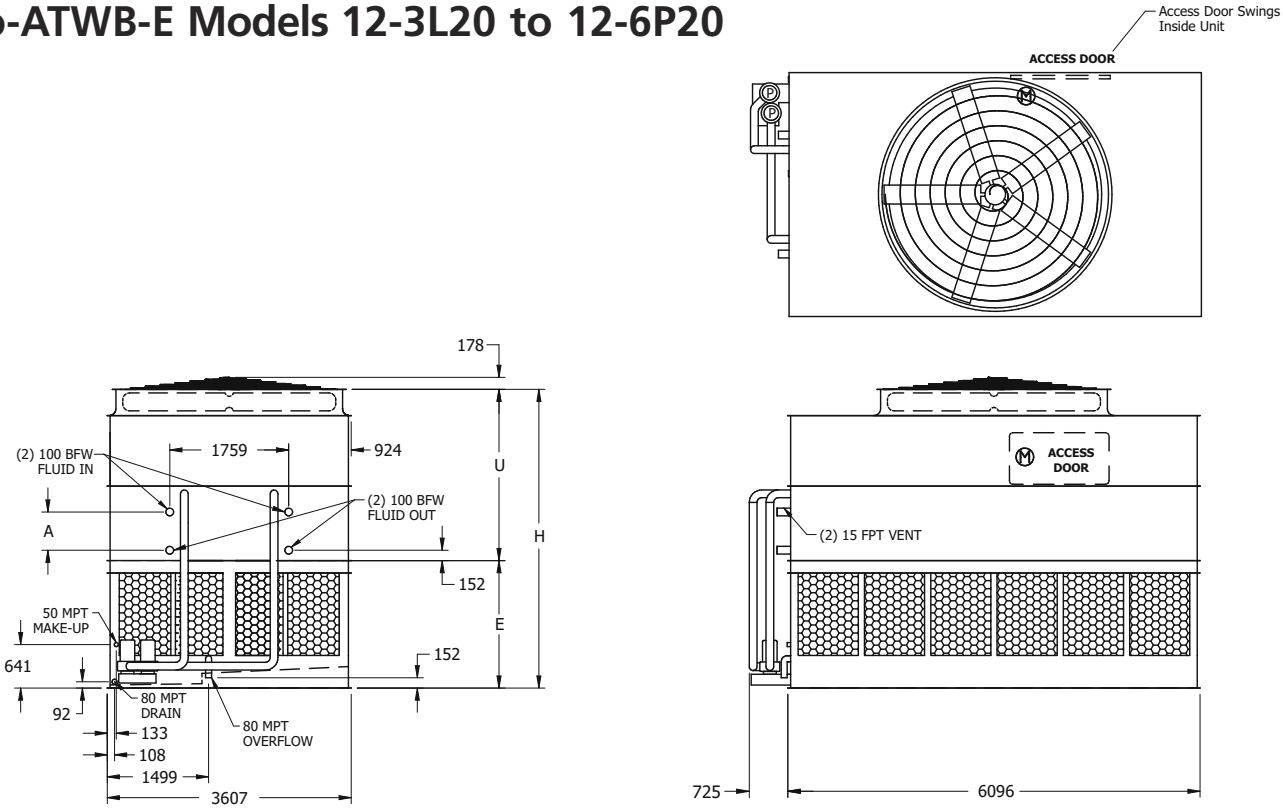
* Liters shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (300mm would normally be sufficient).

△ When a remote sump arrangement is selected, the spray pump, suction strainer and associated piping are omitted; the unit is provided with an oversized outlet to facilitate drainage to the remote sump.

▲ Unit dimensions and coil connections may vary slightly from catalog. See factory certified prints for dimensions, quantity of coil connections, and piping configuration.

Coil connections are 4" bevel for welding (BFW)

eco-ATWB-E Models 12-3L20 to 12-6P20



Notes: The number of coil connections doubles when the flow rate exceeds 56 l/s.
For additional Weights and Heights of optional **Low & Super Low Sound Fan** execution, see table on page 43.

eco-ATWB-E Model Number	Weights (kg)			Fans		Spray Pump	Coil Volume	Remote Sump △			Dimensions (mm) ▲			
	Shipping	Heaviest Section†	Operating	kW	m²/s	kW	(liters)	Liters Req'd*	Conn. Size (mm)	Operating Weight (kg)	Height H	Lower E	Upper U	Coil A
eco-ATWB-E 12-3L20	12520	10360	19080	18,5	58,7	(2) 4	1933	3030	350	16020	4416	1886	2530	565
eco-ATWB-E 12-3M20	12540	10390	19100	22	62,4	(2) 4	1933	3030	350	16040	4416	1886	2530	565
eco-ATWB-E 12-3N20	12610	10460	19170	30	68,1	(2) 4	1933	3030	350	16120	4416	1886	2530	565
eco-ATWB-E 12-3O20	12620	10460	19180	37	72,4	(2) 4	1933	3030	350	16120	4416	1886	2530	565
eco-ATWB-E 12-4L20	14920	12770	22110	18,5	57,0	(2) 4	2553	3030	350	19050	4632	1886	2746	781
eco-ATWB-E 12-4M20	14940	12790	22130	22	60,5	(2) 4	2553	3030	350	19070	4632	1886	2746	781
eco-ATWB-E 12-4N20	15020	12870	22200	30	66,1	(2) 4	2553	3030	350	19140	4632	1886	2746	781
eco-ATWB-E 12-4O20	15020	12870	22210	37	70,3	(2) 4	2553	3030	350	19150	4632	1886	2746	781
eco-ATWB-E 12-5M20	17300	15140	25100	22	58,7	(2) 4	3173	3030	350	22050	4848	1886	2962	997
eco-ATWB-E 12-5N20	17370	15220	25170	30	64,1	(2) 4	3173	3030	350	22120	4848	1886	2962	997
eco-ATWB-E 12-5O20	17370	15220	25180	37	68,2	(2) 4	3173	3030	350	22120	4848	1886	2962	997
eco-ATWB-E 12-5P20	17460	15310	25270	45	71,8	(2) 4	3173	3030	350	22210	4848	1886	2962	997
eco-ATWB-E 12-6N20	19960	17810	28380	30	62,1	(2) 4	3792	3030	350	25330	5064	1886	3178	1213
eco-ATWB-E 12-6O20	19960	17810	28390	37	66,1	(2) 4	3792	3030	350	25330	5064	1886	3178	1213
eco-ATWB-E 12-6P20	20060	17900	28480	45	69,6	(2) 4	3792	3030	350	25420	5064	1886	3178	1213

† Heaviest section is the coil / fan section

* Liters shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (300mm would normally be sufficient).

△ When a remote sump arrangement is selected, the spray pump, suction strainer and associated piping are omitted; the unit is provided with an oversized outlet to facilitate drainage to the remote sump.

▲ Unit dimensions and coil connections may vary slightly from catalog. See factory certified prints for dimensions, quantity of coil connections, and piping configuration.

Coil connections are 4" bevel for welding (BFW)

Low Sound & Super Low Sound Fans Additional Height and Weight

eco-ATWB-E

eco-ATWB-E Model No			Low Sound Fan Additional Height (mm)	Super Low Sound Fan	
				Additional Height (mm)	Additional Weight (kg)
9-3G8	to	9-6J8	101	432	70
8-3G9	to	8-6K9	101	432	60
8-3H11	to	8-6K11	101	432	60
8-3H12	to	8-6L12	101	432	60
8-3I14	to	8-6M14	101	432	60
8-3G18	to	8-6K18	101	432	120
8-3H21	to	8-6K21	101	432	120
10-3I12	to	10-6M12	0	546	320
10-3I18	to	10-6N18	0	546	320
12-3J12	to	12-6N12	0	546	320
12-3K14	to	12-6N14	0	546	320
12-3K18	to	12-6P18	178	394	550
12-3L20	to	12-6P20	178	394	550

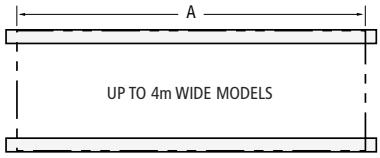
eco-ATWB-E

RECOMMENDED STEEL SUPPORT

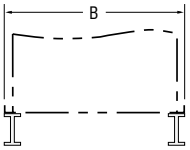
The recommended support for EVAPCO Closed Circuit Coolers is structural "I" beams located under the outer flanges and running the entire length of the unit. The unit should be elevated to allow access underneath the unit and to the roof below. Mounting holes 19 mm in diameter are located in the bottom flanges of the pan section to provide for bolting to the structural steel. (Refer to certified drawings from the factory for bolt hole locations.)

Beams should be level before setting the unit in place. Do not level the unit by shimming between the unit and the structural steel. Dimensions weights and data are subject to change without notice. Refer to the factory certified drawings for exact dimensions.

Plan Views



End Elevations



SUPPORTING STEEL DIMENSIONS		
eco-ATWB-E	**A**	**B**
9-3G8 to 9-6J8	2578	2283
8-3G9 to 8-6K9	2731	2388
8-3H11 to 8-6K11	3188	2388
8-3H12 to 8-6L12	3651	2388
8-3I14 to 8-6M14	4261	2388
8-3G18 to 8-6K18	5486	2388
8-3H21 to 8-6K21	6401	2388
	A	**B**
10-3I12 to 10-6M12	3651	2991
10-3I18 to 10-6N18	5486	2991
	A	**B**
12-3J12 to 12-6N12	3651	3607
12-3K14 to 12-6N14	4261	3607
12-3K18 to 12-6P18	5486	3607
12-3L20 to 12-6P20	6096	3607

SPECIFICATIONS

eco-ATWB-E

FACTORY FABRICATED INDUCED DRAFT eco-ATWB-E CLOSED CIRCUIT COOLER

General

Furnish and install factory assembled closed circuit cooler of induced draft counterflow design with a horizontal multiple side air entry and a vertical air discharge.
The unit shall be completely factory assembled and conform to the specifications and schedules.

The closed circuit cooler shall be CTI certified and have the capacity to cool ____ l/s water / glycol from _____°C to_____°C with a_____ °C entering wet bulb temperature and a dry bulb switchover temperature of _____ °C.

Optional: (If dry operating conditions are different than the wet operating conditions)
Each unit shall also cool _____l/s of_____ from _____ °C to _____ °C with a _____ °C entering dry bulb temperature.

The total fan power should not exceed _____kW.
The total pump power should not exceed _____ kW.

The total overall unit dimensions should not exceed the following:
Length: _____ mm Width: _____ mm Height: _____ mm

The maximum operating weight should not exceed _____ kg.

The unit will be delivered in two parts: the bottom basin - louver section and the heat transfer - fan section.
The unit (top and bottom section) shall be joined together with elastic sealer and bolted together with corrosion resistant fasteners.

Approved manufacturer **Evapco – model eco-ATWB-E** _____

Thermal Performance – Performance Warranty
The cooler shall be capable of performing the thermal duties as shown in the schedule and on the drawings, and its design thermal rating shall be certified by the Cooling Technology Institute (C.T.I.) and the Eurovent Certification Company (ECC). Only models with performance certified by CTI and ECC will be approved.

Manufacturers' performance guarantee without ECC-CTI certification for the proposed model or an independent field performance test shall not be accepted.

Applicable Standards

a) CTI ATC 128 Test Code for Measurement of Sound from Water Cooling Towers
b) CTI STD 201 Standard for Thermal Performance Certification of Evaporative Heat Rejection Equipment.
c) Eurovent Rating Standard for Cooling Towers

Submittals

a) Shop drawings: submit shop drawings indicating dimensions, weight loadings and required clearances.
b) Product data: submit manufacturers technical product data, original selection printouts and clearance requirements.
c) Complete noise data sheet for the selected closed circuit cooler(s).
d) Maintenance data for the closed circuit cooler(s) and
e) The manufacturer shall provide factory test run certificates of the fans and fan motor.

Product Delivery – Storage and Handling

a) a)The contractor shall make the provisions for proper storage at site before installation and handle the product per the instructions of the manufacturer.
b) Once installed provide the necessary measures to keep units clean and protected from any dust and mechanical damage.

Quality Assurance

a) The manufacturer shall have a quality assurance system in place which is certified by an accredited registrar and complying with the requirements of ISO 9001. This is to guarantee a consistant level of product and servicequality.
b) Manufacturers without ISO 9001 certification are not acceptable.

Warranty

a) The products will be warranted for a period of minimum two (2) years from the date of shipment.

PRODUCT

Construction – Corrosion Resistance

a) The structure and all steel elements of the pan and casing shall be constructed of Z 725 hot dip galvanized steel for long life and durability. Alternatives with lower zinc layer thickness and external paint or coating are not accepted as equal.
b) The strainer shall be made of stainless steel type 304.
c) During fabrication all panel edges shall be coated with a 95% pure zinc compound.
d) Casing materials shall be of non flammable construction only.

OPTIONAL EXECUTION – BASIN IN AISI 304

Construction – Corrosion Resistance

a) The structure and all steel elements of the Basin and Louver section up to the water level shall be made of stainless steel AISI 304.
b) Alternatives with hot dip galvanized steel and epoxy coatings in lieu of the stainless steel AISI 304 are not considered to be equal and are not accepted.
c) All other steel components of the casing shall be constructed of Z 725 hot dip galvanized steel for long life and durability. Alternatives with lower zinc layer thickness and external paint or coating or FRP materials are not accepted as equal.
d) The strainer shall be made of stainless steel AISI 304.
e) During fabrication all galvanized steel panel edges shall be coated with a 95% pure zinc compound.
f) Casing materials shall be of non flammable construction only.

OPTIONAL EXECUTION – COMPLETE UNIT IN STAINLESS STEEL AISI 304 (except heat exchange coil(s))

Construction – Corrosion Resistance

a) The structure and all steel elements shall be made of AISI 304.
b) Alternatives with hot dip galvanized steel and epoxy coatings in lieu of the AISI 304 are not considered to be equal and are not accepted.
c) The strainer shall be made of stainless steel AISI 304.
d) Casing materials shall be of non flammable construction only.

Closed Circuit Cooler Basin

a) Standard basin accessories include: overflow, drain, strainer and brass make up valve with plastic float ball.
b) The strainer shall be made of AISI 304.
c) The entire pan area shall incorporate a sloped and stepped basin design to prevent sediment built up, biological film and standing water.
d) Upper and lower basin bottoms shall be sloped to provide drainage of the complete basin section.
e) The basin can be inspected while the unit is in operation with the fan(s) and pump(s) running.

Air Inlet Louvers

a) The air inlet louvers shall be constructed of UV inhibited polyvinyl chloride (PVC), mounted in easily removable frames for easy access to the basin.
b) The louvers shall be at four sides to provide easy access to the basin interior.
c) The louvers shall have a minimum of two changes in air direction to prevent splash out and block direct sunlight from entering the basin.

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d) The louvers will have a 19 mm opening to prevent debris from entering the basin.

Casing Section
Heat Transfer Coil
a) The closed circuit cooler shall use internally enhanced heat exchange coils of an elliptical tube design to obtain lower air flow resistance and allow higher water loadings around the tubes. Each row of the heat exchanger coil shall be provided with elliptical spiral fins to increase the evaporative and dry thermal performance of the unit.
b) The heat transfer coil(s) shall be made of all prime surface, encased in a steel framework and hot dip galvanized after fabrication as a complete assembly.
c) The tubes shall be arranged in a self spacing, staggered pattern in the direction of air flow for maximum heat transfer efficiency and minimum pressure drop.
d) The heat exchange coils shall be air pressure tested under water.
e) The design and manufacturing process shall be approved and in accordance with the "Pressure Equipment Directive " – PED 97 / 23 EC.
f) The manufacturer shall be responsible for the manufacturing and performance testing of the entire heat transfer coil. This is to assure single source responsibility.
g) The casing shall totally encase the complete coil section to protect the complete coil from direct atmospheric contact.
h) The pressure drop of the process fluid through the coil shall not exceed ____kPa.

Water Distribution
a) The water distribution system shall be completely enclosed and protected from sunlight exposure, environmental elements and debris. Water distribution systems with direct exposure to the environment are not allowed.
b) The spray header and branches shall be constructed of Schedule 40, Polyvinyl Chloride (PVC) pipe for corrosion resistance.
c) The water shall be distributed over the coil by precision molded ZM spray nozzles with large minimum orifice openings and integral sludge ring to eliminate clogging.
d) The nozzles shall be threaded into the water distribution piping to assure positive positioning and easy removal for maintenance. Snap in or strapped on nozzles are not accepted.
e) Each coil shall have a dedicated recirculation pump and water distribution system, which are completely separated by a water tight partition which begins above the water distribution systems and ends at the basin in order to allow for simultaneous wet and dry operation.

Water Circulation Pumps
a) The unit will have 2 indipendent circulation pumps to guarantee the best regulation to reduce water consuption
b) The pumps shall be a close coupled, centrifugal type with mechanical seal , installed vertically at the factory to allow free drainage on shut down.
c) 2x ____ kW totally enclosed motors suitable for outdoor service shall be furnished.
d) The motors shall be suitable for the following power supply: ___volts, ___hertz and ____phase and 2x____kW.

Drift Eliminators
a) The drift eliminators shall be constructed of entirely inert polyvinyl (PVC) that has been specially treated to resist ultra violet light.
b) Assembled in easily handled sections, the eliminator blades shall be spaced on 25 mm centers and shall incorporate three changes in air direction to assure efficient removal of entrained moisture from the discharge air stream.
c) The maximum drift rate shall not exceed 0,001 % of the circulating water rate.

Access Door
a) A large hinged access door shall provide access to the fan section for maintenance.

Mechanical Equipment
Axial Propeller Fan(s) (Standard)
a) Fan shall be heavy duty wide chord axial propeller type, statically balanced and constructed of extruded aluminum alloy blades.
b) Fans shall be installed in a closely fitted cowl with venturi air inlet for maximum fan efficiency.
c) The fans shall utilize a soft connect blade to hub design, compatible with variable speed drives, to avoid transmission of vertical forces to the unit structure.
d) Each fan blade shall be individually adjustable.
e) The fan cowl shall be covered with a heavy gauge hot dip galvanized steel wire fan guard.
f) The fan – drive system (fan – drive – motor) shall be factory mounted, adjusted and undergo a trial run in the factory before shipment.

Axial Propeller Fan(s) - Low Sound Fan (Alternative)
a) Fan shall be heavy duty wide chord axial propeller type, statically balanced and constructed of extruded aluminum alloy blades.
b) Fans shall be installed in a closely fitted cowl with venturi air inlet for maximum fan efficiency.
c) The fans shall utilize a soft connect blade to hub design, compatible with variable speed drives, to avoid transmission of vertical forces to the unit structure.
d) Each fan blade shall be individually adjustable.
e) The fan cowl shall be covered with a heavy gauge hot dip galvanized steel wire fan guard.
f) The fan – drive system (fan – drive – motor) shall be factory mounted, adjusted and undergo a trial run in the factory before shipment.

Axial Propoller Fan(s) - Super Low Sound Fan (Alternative)
a) Fan shall be extremely wide chord axial, one piece heavy duty propeller type, statically balanced and made of FRP.
b) Fans will be installed in a closely fitted cowl with venturi air inlet for maximum fan efficiency.
c) The fan cowl shall be covered with a heavy gauge hot dip galvanized steel wire fan guard.
d) The fan – drive system (fan – drive – motor) shall be factory mounted, adjusted and undergo a trial run in the factory before shipment.
e) The fans are high efficiency and operate with no loss of thermal performance

Bearings and Drive
a) The fan shaft (s) shall be supported by heavy duty, self aligning ball type bearings with cast iron housings.
b) The bearings shall be rated for an L-10 life of 75000 hours.
c) The fan drive sheaves shall be aluminum alloy.
d) The belt shall be a multigroove belt system, constructed of neoprene with polyester cords and designed for 150% of the motor nameplate horsepower.
e) The grease fittings shall be extended to a location just inside the access door.

Motor (2.3 & 2.4 meter wide Models)
a) The fan motor shall be Totally Enclosed Fan Cooled (TEFC), squirrel cage, ball bearing type motor.
b) The motor shall be specially designed for cooling tower use with moisture protection on the winding, shaft and bearings.
c) The motor shall be minimum IP 55 degree of protection, Class F insulation, Service Factor 1 and selected for the appropriate cooling tower duty and the correct ambient temperature but minimum 40°C.
d) Motors bearings shall be double sealed non-relubricable or external grease nipples shall be provided.
e) The motor shall be mounted on an adjustable heavy duty steel motor base.
f) A hinged protective cover shall shield the motor and sheave from the weather.

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g) The motor power supply shall be ____ volts, ____ hertz and ___ phase.

Motor (3 and 3.6 meter wide Models)

a) The fan motor shall be Totally Enclosed Air Over (TEAO), squirrel cage, ball bearing type motor.
b) The motor shall be specially designed for cooling tower use with moisture protection on the windings, shaft and bearings.
c) The motor shall be minimum IP 55 degree of protection, Class F insulation, Service Factor 1 and selected for the appropriate cooling tower duty and the correct ambient temperature but minimum 40°C.
d) Motor bearings shall be double sealed non-relubricable or external grease nipples shall be provided.
e) The motor shall be mounted on an adjustable heavy duty steel motor base.
f) The motor base shall be able to swing to the outside of the unit for repair or removal.
g) The motor power supply shall be ____ volts, ____ hertz and ____ phase.

Sound Levels

Sound Level

The maximum sound pressure levels (dB) measured 1.5 m 45° from the top of the closed circuit cooler operating at full fan speed shall not exceed the sound levels detailed below.

Location	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB(A)
Fan discharge									
Air inlet /end									

CONTROLS

Control panel

The unit(s) shall be provided with a control panel which operates by measuring and analyzing water inlet and outlet temperature simultaneous with ambient dry bulb monitoring in order to minimize the evaporative cooling mode of operation and to save system water. The control panel can also be programmed to operate with a water savings or energy savings priority.

The system will include:
A MODBUS 485* Port for the Building Automation System

- Programmable Logic Control
- Fluid Inlet Temperature Sensor(s)
- Fluid Outlet Temperature Sensor(s)
- Basin Temperature Sensor(s)
- Ambient Dry Bulb Sensor(s)
- Variable frequency drive(s) For Fan Motor(s)
- Recirculating Pump Motor Starter(s).
- Main Disconnect
- Manual Bypass
- DC power supply for the PLC and instrumentation.
- Heater Package Controls w/ Contactor with Overload Protection
- Control Power Transformer
- Electronic Water Level Control Package

ACCESSORIES (Optional)

Electric Heaters

a) The closed circuit cooler cold water basin shall be provided with an electric heater package to prevent freezing of the water in the cold water basin, when the pump is shut down.
b) The electric heater package includes: electric heater element(s), thermostat and low water level cutoff.
c) The heaters shall be selected to maintain 4 °C basin water temperature at ____ °C ambient
d) The heater(s) shall be ____V / ____ phase / ____ Hz electric power supply.

Three Probe Electric Water Level Control Package

a) The closed circuit cooler manufacturer shall provide an electric water level control package instead of the mechanical float valve arrangement.
b) The package consist of the following elements :

- Multiple heavy duty stainless steel 316 static sensors mounted in a stilling chamber outside the unit. Electrodes or sensors mounted inside the unit are not accepted as their operation will be disturbed by the moving water in the basin.
- An ABS, IP 56 case contains all the contactors for the different level probes and will provide an output signal of a relay for automatic filling and one relay for alarm level.
- The power supply to the control package is 24 Vac / 230 Vac - ____ Hz .
- A weather protected solenoid valve (PN16) for the water make up ready for piping to a water supply with pressure between 140 kPa and 340 kPa.

Vibration Switch

a) A vibration limit switch shall be installed on the mechanical equipment support and wired into the control panel. The purpose of this switch is to interrupt power to the motor in the event of excessive vibration.
b) The switch shall be adjustable for sensitivity and shall require manual reset.

Vertical Access Ladders

a) A vertical ladder with safety cage which provide easy access to the water distribution system and drive components shall be provided with the closed circuit cooler(s).
b) The ladder will be completed with a safety cage for safety purposes.
c) Ladder safety cage shall meet OSHA - CE - BS requirements.

Service Platform

a) The closed circuit cooler shall be supplied with an external service platform.
b) The external service platform will be self supporting and include access ladders to the platform.
c) The external service platform will be installed in front of the fan access doors.
d) The platform shall meet OSHA - CE - BS requirements.

Motor Davit

a) The closed circuit cooler shall be supplied with a motor davit to facilitate the removal of fan motor(s) and fan(s).
b) The davit and braket are constructed of aluminum and are mounted on the side of the unit.
c) The fan motor davit ships loose with the unit and is installed in the field.

Water Silencer

a) The water silencers are located in the falling water area of the cold water basin.
b) The water silencers will reduce the overall sound levels 4 dB (A) to 7 dB (A) measured at 1.5 m from the side or end of the unit, when the fans are running, and 9 dB (A) to 12 dB (A) when fans are off.
c) The water silencers are constructed of lightweight PVC sections and can be easily removed for access to the basin area.
d) The water silencers will have no impact on the unit's thermal performance.

OUR PRODUCTS ARE MANUFACTURED WORLDWIDE

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