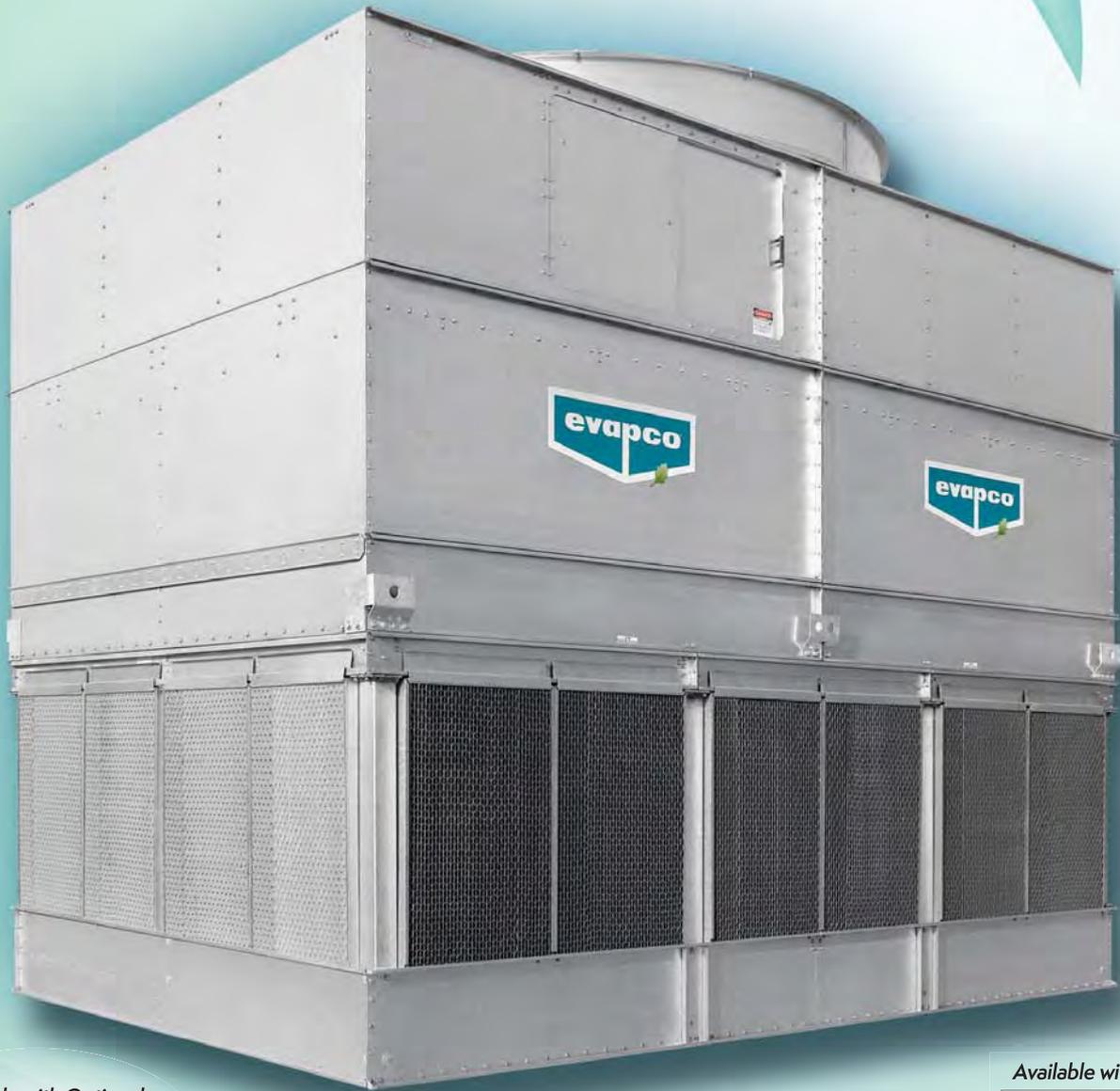


EVAPORATIVE CONDENSERS

ATC-E

ADVANCED TECHNOLOGY CONDENSER



Available with Optional
304L or 316L Stainless Steel
TITAN COIL

Available with Optional
evapco
WATER SYSTEMS

Available in Capacities from 35 to 2,637 Ammonia Tons!



IARW International Association of Refrigerated Warehouses

Member of
iiar
International Institute of Ammonia Refrigeration
www.iiar.org

AHRI Air-Conditioning, Heating, and Refrigeration Institute

ATC-E Design and Construction Features

The ATC-E line of evaporative condensers reflects EVAPCO's continuing commitment to research and development. The advanced design provides owners with many operational and performance advantages. The owner oriented features of the ATC-E along with the independent certification of IBC compliance reinforce the ATC's position as the premier induced draft evaporative condenser for the industrial refrigeration industry.



PVC Spray Distribution Header with ZM® II Nozzles

- Large orifice nozzles prevent clogging (no moving parts).
- Redesigned nozzles for superior water distribution.
- Nozzles are threaded into header at proper orientation.
- Fixed position nozzles require zero maintenance.
- Threaded end caps for ease of cleaning.
- Guaranteed for life.

Thermal-Pak® II Heat Transfer Technology

- More surface area per plan area than competitive designs.
- Improved heat transfer efficiency due to tube geometry and orientation of tubes.
- Lower refrigerant charge.



Water Saver Drift Eliminators

- Patented design reduces drift rate to 0.001%.
- Made from corrosion resistant PVC for long life. U.S. Patent No. 6,315,804



Factory Mounted Solid Chemical Water Treatment Systems (Optional, not shown)

The ATC-E is available with a **Smart Shield®** (not shown) solid chemical water treatment system. The **Smart Shield®** is environmentally sensitive alternatives for treating water in evaporative cooled equipment. The **Smart Shield®** systems include all components required for an effective water treatment system; factory mounted and wired.

Totally Enclosed Pump Motors

- Help assure long, trouble-free operation.



Stainless Steel Strainer

- Resists corrosion better than other materials.



Super Low Sound Fan (Optional)

- 9-15 dB(A) sound reduction at most.
- Extremely wide chord fan blades for sound sensitive applications.
- Molded heavy-duty construction.

G-235 Mill Hot-Dip Galvanized Steel Construction

(Stainless steel available as affordable option)

Advanced Drive System Design

- 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.

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.



Unique Field Seam

- Eliminates up to 66% of fasteners.
- Self guiding channels improve quality of field seam to eliminate leaks.
- Easy to install.
- Lower installation cost.

Air Inlet Access Door (Optional)

- Increased ease of access to basin.
- Hinged access panel with quick release mechanism.
- Available on most models.



WST Air Inlet Louvers (Water and Sight Tight)

- Easily removable for access.
 - Design keeps sunlight out—preventing biological growth.
 - Keeps water in while keeping dirt and debris out.
- U.S. Patent No. 7,927,196



"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.



ATC-E Design Features

Proven Performance and Design Flexibility



About EVAPCO

EVAPCO is the global innovator in heat transfer solutions. Our pledge is to make everyday life easier, more comfortable, more reliable, and more sustainable for people everywhere. With manufacturing facilities and sales offices in more than 40 countries and 48 active US patents – we are the team that engineers and contractors know they can count on for life.

Contact

your local EVAPCO Representative
or visit evapcoasia.com to learn more.

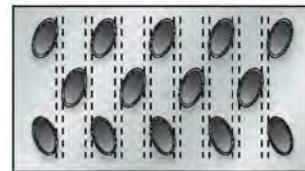
Thermal-Pak® II Coil

EVAPCO's Thermal-Pak® II condensing coils are designed for maximum heat transfer efficiency. This unique coil design utilizes counterflow heat transfer. The rows of elliptical tubes are staggered and angled in the direction of airflow to enhance air turbulence, thereby increasing heat transfer while minimizing airside pressure drop.

The design features of EVAPCO's Thermal-Pak® II condensing coils ensure the end user will receive the best evaporative heat transfer efficiency.

These characteristics and other engineering advancements of the Thermal-Pak® II have been proven in EVAPCO's world-class research and development laboratory resulting in the following end user benefits:

- Lower Operating Refrigerant Charge
- Low Power Consumption Per Ton
- Lower Operating Weight
- Small Plan Area Per Ton



Thermal-Pak® II Coil by EVAPCO



Round Tube Coil by Others

The coils are manufactured from high quality steel tubing following the most stringent quality control procedures. Each circuit is inspected to assure the material quality and then tested before being assembled into a coil. Finally, the assembled coil is tested at 2.69MPa air pressure under water to make sure it is leak free.

To protect the coil against corrosion, it is placed in a heavy-duty steel frame and the entire assembly is dipped in molten zinc (hot dip galvanized) at a temperature of approximately 427°C.



Thermal-Pak® II Coil

ATC-E Design Features

Construction Features

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.

G-235 Mill Hot-Dip Galvanized Steel Construction

Mill hot-dip galvanized steel has been successfully used for over 40 years for the protection of evaporative condensers 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 G-235 mill hot-dip galvanized steel.

G-235 designation means there is a minimum of 2.35 ounces of zinc per square foot (725g of zinc per square meter) of surface area as measured in a triple spot test.

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 condenser. EVAPCO uses only stainless steel for this very important component.

Unique Seam Design—Eliminate Field Leaks

The ATC-E features EVAPCO's unique panel construction design which includes a special butyl tape sealer. Each joint is then backed with a secondary caulking compound and encased in a double-brake flange for added strength and structural integrity. This unique sealing system has been proven effective in both laboratory tests and years of field application.

Improved Maintenance

ZM[®]II Spray Nozzle Water Distribution System

Even and constant water distribution is paramount for reliable, scale-free evaporative condensing. EVAPCO's Zero Maintenance ZM[®]II Spray Nozzle remains clog-free under the toughest conditions to deliver approximately 4 l/s to every square meter of coil plan area.

The heavy-duty ABS ZM[®]II Spray Nozzles have a 32mm diameter opening and a 32mm splash plate clearance. The fixed position ZM[®]II Spray Nozzles are mounted in corrosion-free PVC water distribution pipes that have threaded and caps. Together, these elements combine to provide unequalled coil coverage, enhanced droplet formation and make the industries best performing maintenance-free water distribution system.



ZM[®] II Nozzle

Alternate Materials of Construction

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

Stainless Steel Basin

The basin area of a condenser is often subjected to high concentrations of impurities and silt. 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.

Stainless Steel Casing

EVAPCO offers optional stainless steel construction for superior corrosion resistance on various casing panel configurations including water touch basin, water touch unit, and all stainless steel panel construction. These options are available in Type 304 or Type 316 stainless steel for improved corrosion protection and jobsite requirement flexibility.

Stainless Steel Coils

The heat exchanger coil is the heart of the evaporative condenser. For this critical component, EVAPCO offers the options of Type 304L or Type 316L stainless steel construction using the Thermal Pak[®] II coil design. Highly efficient heat transfer coils with the ultimate corrosion protection for evaporative cooling applications.

ATC-E Induced Draft Axial Fan Design Features

Belt Drive Units - 1.2m through 2.5m Wide Models and multi-cell arrangements

ATC-50E to ATC-926E

The fan motor and drive assembly on these units is designed to allow easy servicing of the motor and **adjustment of the belt tension from the exterior of the unit**. A T.E.F.C. fan motor is mounted on the outside of these models. A protective cover swings away to allow servicing and belt adjustment. A large hinged access door with a "quick release" latch provides access to the fan section for maintenance. (Not available on 1.2m Wide Models)



1.2m External Belt Driven Motor Mount



2.2m through 2.5m wide models and multi-cell arrangements
External Motor Mount (with optional ladder)

Belt Drive Units - 3m and 3.6m Wide Models and multi-cell arrangements

ATC-XE298E to ATC-XC1340E

ATC-428E to ATC-3714E

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.



Motor Base Assembly

The motor base is designed to swing out through a very large, 1.3 square meters access opening. This allows for easy servicing of the motor.



Motor Access

ATC-E Design Features

Drive System

Inverter Duty Motors: Inverter Duty Motors are standard on ATC-E condensers. Inverter Duty motors are totally enclosed and inverter capable (VFD by others).

Note: Variable Frequency Drive control may require other component modification such as motor shaft grounding brushes, AC load reactors, low pass filters and tuned trap filters to ensure proper motor performance and service life.

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 minimum 150% of the motor nameplate kW for long life and durability.

Fan Shaft Bearing: The fan shaft bearings in ATC-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 bearing available.

Aluminum Alloy Sheaves: Fan sheaves are constructed of corrosion free aluminum for long life, eliminating the corrosion that exists on cast steel sheaves, thereby extending belt life.

Superior Water Saving Drift Eliminators

An extremely efficient drift eliminator system is standard on EVAPCO condensers. 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. 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.



Water Saving Drift Eliminator

Superior WST Air Inlet Louver Design

EVAPCO'S 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.

Developed with computational fluid dynamics (CFD) software and tested in EVAPCO's R&D center, 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.



Inlet Louver Design

"Clean Pan" Basin Design

EVAPCO ATC-E condensers feature a sloped basin from the upper to lower pan section. This "Clean Pan" design allows the water to be completely drained from the basin. The condenser water will drain from the upper section to the



depressed lower pan 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.

Air Inlet Access Door (Optional)

To aid in basin maintenance, ATC-E models can be equipped with an optional air inlet access door. This feature improves the maintainability of the condenser by allowing easy access to the make-up float assembly and strainer for inspection without removing an entire inlet louver. Air inlet access doors are not available on some of the ATC-E models.



IBC Compliance

IBC Compliance

EVAPCO has been applying advanced structural technology to evaporative condensers for many years. Following seismic events in the mid 1990's EVAPCO introduced the UB Series of induced draft cooling towers, fluid coolers and evaporative condensers. These products were designed, built and independently certified for extreme seismic and wind forces. With the advent of the International Building Code, EVAPCO is now offering a new line of ATC-E Evaporative Condensers that is IBC compliant as standard construction.

International Building Code

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. As of June 2008, all 50 states plus Washington D.C have adopted the International Building Code. Compared to previous building codes that solely examined anchorage, the earthquake provisions contained within the International Building Code address anchorage, structural integrity, and operational capability of a component following a seismic event. The goal of the IBC is to minimize the loss of life and improve the capability of essential facilities to operate after a seismic event.

The International Building Code (IBC) was developed to replace the *BOCA National Building Code*, *ICBO's Uniform Building Code* and *SBCCI's Standard Building Code*. The International Building Code specifies that all components be designed to resist the equivalent seismic forces as the structure to which they are installed whereas previous building codes focused exclusively on the structure of the building to provide resistance against seismic forces. These components include all aspects of the building architectural, electrical and mechanical systems. The failure of these components during a seismic event has been a common occurrence in recent history. Although the structure of the building may be relatively undamaged from an earthquake, the damage to the nonstructural components could be significant and result in considerable secondary damage to the building (ie. flooding, fire, structural damage).

Importance Factor (I_p)

A major parameter that must be determined prior to calculating the seismic design force is the component importance factor (I_p). ASCE 7-10 defines the component importance factor as:

Importance Factor, I_p	Classification
1.5	<ul style="list-style-type: none">• Life safety component required to function after seismic event.• Component containing hazardous content where the quantity, if released, exceeds a threshold limit that is sufficient to pose a threat to the public.• Components installed at Risk Category IV (essential) facilities
1.0	All other components

The importance factor has significant impact on the design of the equipment necessary for the application. Please contact the factory for assistance in understanding your needs.

Design Implementation

In order to achieve this goal, an architect or civil engineer is responsible for analyzing the soil and the design of a structure to determine the factors to be used and provide those in construction documents. A mechanical consulting engineer and/or design build contractor applies these factors to advise the manufacturer on the proper design for the application. EVAPCO takes this information and determines the necessary condenser to meet IBC regulations. This process ensures that the mechanical equipment and its components are seismically compliant per the provisions of the International Building Code.

Independent Certification

All EVAPCO ATC-E units are designed, analyzed, and constructed in accordance with the latest edition of the International Building Code (IBC) Regulations. ATC-E is offered with a choice of two structural design packages: standard construction and upgraded construction.

For further questions regarding IBC compliance, please contact your local EVAPCO Representative or visit www.evapcoasia.com.

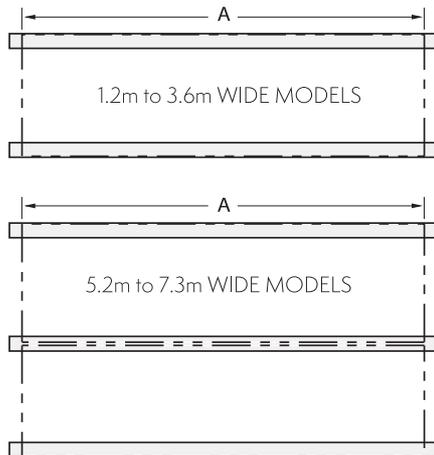
ATC-E Steel Support

EVAPCO ATC-E condensers are designed to be supported with structural "I" beams located under the outer flanges and running the entire length of the unit. Mounting holes, 19mm in diameter are located in the bottom channels of the pan section to provide for bolting to the structural steel. (Refer to certified drawings from the factory for bolt hole locations.)

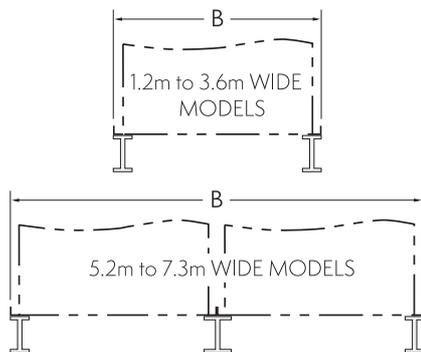
Beams should be level to within 1.5mm in 1m before setting the unit in place. Do not level the unit by shimming between it and the "I" beams as this will not provide proper longitudinal support.

NOTE: Consult IBC for required steel support layout and structural design.

Plan Views



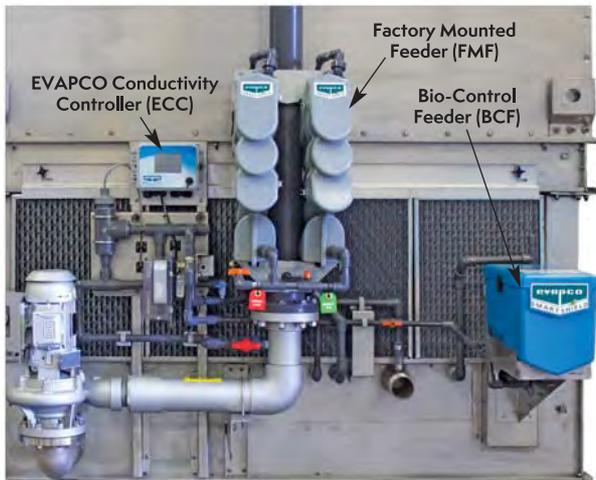
End Elevations



Steel Dimensions		
1.2m Wide Models	A	B
ATC-50E to 80E	1826	1232
90E to 120E	2731	1232
135E to 165E	3651	1232
2.2m Wide Models	A	B
ATC-181E to 261E	2731	2235
264E to 351E	3651	2235
362E to 522E	5486	2235
528E to 702E	7366	2235
724E to 1044E	11036	2235
4.6m Wide Models	A	B
ATC-361E to 521E	2731	4601
526E to 701E	3651	4601
723E to 1043E	5486	4601
2.5m Wide Models	A	B
ATC-170E to 247E	2578	2283
218E to 305E	2731	2578
246E to 369E	3188	2578
358E to 409E	3651	2578
385E to 473E	4261	2578
486E to 630E	5486	2578
508E to 755E	6401	2578
643E to 809E	7366	2578
800E to 950E	8585	2578
3m Wide Models	A	B
ATC-XE298E to XC462E	3651	2991
XE406E to XC669E	5486	2991
XE596E to XC925E	7366	2991
XE812E to XC1340E	11036	2991
5.2m Wide Models	A	B
ATC-639E to 805E	3651	5286
780E to 926E	4261	5286
3.6m Wide Models	A	B
ATC-428E to 583E	3651	3607
545E to 647E	4261	3607
642E to 892E	5486	3607
791E to 967E	6096	3607
858E to 1167E	7366	3607
1164E to 1294E	8585	3607
1192E to 1784E	11036	3607
1625E to 1925E	12256	3607
7.3m Wide Models	A	B
ATC-857E to 1166E	3651	7344
1163E to 1293E	4261	7344
1191E to 1783E	5486	7344
1616E to 1915E	6096	7344
1879E to 2320E	7366	7344
2256E to 2509E	8585	7344
2490E to 3459E	11036	7344
2855E to 3714E	12256	7344

Optional Equipment

Smart Shield® Solid Chemical Water Treatment System



EVAPCO's **Smart Shield®** system utilizes proven solid chemistry delivered via our revolutionary feed system. Patented controlled release scale and corrosion inhibitor is fed whenever your spray water pump is energized, keeping your system protected anytime the spray water pump is operating. **Smart Shield®** is a complete water treatment package that:

- Utilizes 'Bag in Bag' no touch chemical replenishments, making reloads easier and safer
- Creates reduced packaging, shipping and handling providing a reduced carbon footprint compared to liquid chemicals
- Eliminates the hazards associated with liquid chemicals, potential for liquid spills and the need for expensive feed pumps making it the easiest and safest chemical water treatment system available today

Watch a short product video: evapco.com, evapcoasia.com

US 8,398,850
US 8,518,271
US 9,938,161

Multiple Circuit Coils

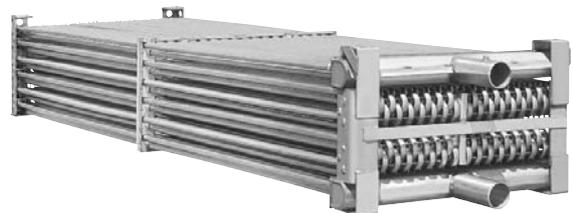
Condensers may be supplied with multiple circuit coils to match various system requirements such as split systems, or if a glycol or water circuit is desired for compressor head cooling.

ASME Coils

Evaporative condensers can be furnished with condensing coils manufactured in accordance with the ASME Pressure Vessel Code Section VIII, Division I. Coils built with this option will bear a ASME stamp U designator indicating their compliance with the ASME code.

TITAN Coils – Stainless Steel Construction

EVAPCO offers the options of Type 304L or Type 316L stainless steel construction using the Thermal Pak® II coil design. Highly efficient heat transfer coils with the ultimate corrosion resistance and protection with five-year coil warranty.



Stainless Steel Basin

ATC-E condensers are available with an inexpensive all stainless steel basin section. This provides superior corrosion resistance over other materials of construction.

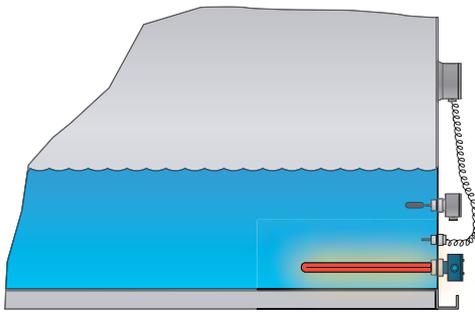
Self Supporting Service Platforms

Condensers 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 is located at each maintenance access door.

Optional Equipment

Electric Heaters

Electric immersion heaters are available factory installed in the basin of the condenser. They are sized to maintain a +4°C to +5°C pan water temperature with the fans off and an ambient air temperature of -18°C. They are furnished with a thermostat to cycle the heater on when required and a low water protection device to prevent the heater elements from energizing unless they are completely submerged. All components are in weather proof enclosures for outdoor use. The heater power contactors and electric wiring are not included as standard.

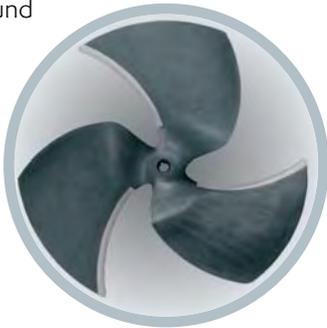


Heater Sizes (kW)			
Models	-18°C	-29°C	-40°C
ATC-50E to 80E	3	4	5
90E to 120E	4	5	7
135E to 165E	5	7	9
181E to 261E	6	8	(2) 6
264E to 351E	8	(2) 6	(2) 8
362E to 522E	8	(2) 8	(2) 8
528E to 702E	(2) 8	(4) 6	(4) 8
724E to 1044E	(2) 8	(4) 6	(4) 8
361E to 521E	(2) 6	(2) 8	(4) 6
526E to 701E	(2) 8	(4) 6	(4) 8
723E to 1043E	(2) 8	(4) 6	(4) 8
170E to 247E	6	8	12
218E to 305E	7	10	15
246E to 369E	8	12	15
358E to 409E	(2) 4	(2) 7	(2) 9
385E to 473E	(2) 5	(2) 7	(2) 10
486E to 630E	(2) 6	(2) 9	(2) 12
508E to 755E	(2) 7	(2) 12	(2) 15
643E to 809E	(4) 4	(4) 7	(4) 9
800E to 950E	(4) 5	(4) 7	(4) 10
639E to 805E	(4) 4	(4) 7	(4) 9
780E to 926E	(4) 5	(4) 7	(4) 10
XE298E to XC462E	(2) 5	(2) 8	(2) 10
XE406E to XC669E	(2) 7	(2) 12	(2) 15
XE596E to XC925E	(4) 5	(4) 8	(4) 10
XE812E to XC1340E	(4) 7	(4) 12	(4) 15
428E to 583E	(2) 6	(2) 9	(2) 12
545E to 647E	(2) 7	(2) 10	(2) 15
642E to 892E	(2) 9	(2) 15	(2) 18
791E to 967E	(2) 10	(2) 15	(3) 15
858E to 1167E	(4) 6	(4) 9	(4) 12
1164E to 1294E	(4) 7	(4) 10	(4) 15
1192E to 1784E	(4) 9	(4) 15	(4) 18
1625E to 1925E	(4) 10	(4) 15	(6) 15
857E to 1166E	(4) 6	(4) 9	(4) 12
1163E to 1293E	(4) 7	(4) 10	(4) 15
1191E to 1783E	(4) 9	(4) 15	(4) 18
1616E to 1915E	(4) 10	(4) 15	(4) 20
1879E to 2320E	(4) 12	(4) 18	(6) 15
2256E to 2509E	(4) 15	(4) 20	(6) 18
2490E to 3459E	(4) 18	(6) 18	(8) 18
2855E to 3714E	(4) 20	(6) 20	(8) 20

Optional Equipment

Super-Low Sound Fan

EVAPCO's Super Low Sound Fan utilizes an extremely wide chord blade design and is ideal for low energy, sound sensitive installations without sacrificing thermal performance. This revolutionary technology is molded heavy duty fiberglass reinforced polyester hub and blade construction utilizing a forward swept blade design. The Super Low Sound Fan is capable of reducing the unit sound pressure levels 9 dB(A) to 15 dB(A) at most, depending on specific unit selection and measurement location.



Dual Fan Option

EVAPCO now offers a Dual Fan arrangement on 3mx5.4m, 3.6mx5.4m and 3.6mx6m nominal box sizes. The Dual Fan option gives users redundancy in large box sizes by providing independent motors, fans, and drives that previously only had a single fan and motor.



Electric Water Level Control

Evaporative condensers 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.



Motor Davit

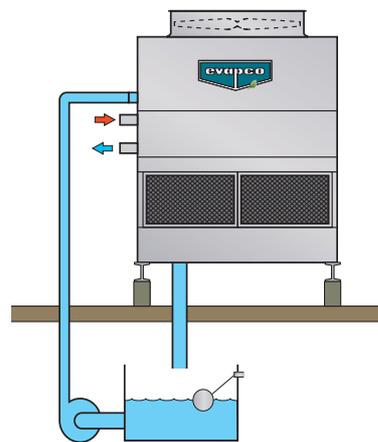
In the event that a fan motor should need to be replaced, a lightweight motor davit is available from which a chain fall can be mounted to easily lower the motor to the ground.



ATC-E Condenser with Optional Service Platform and Motor Davit

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 condenser will be supplied without the spray pump, suction strainers and all associated piping, but with an oversize bottom outlet.



ATC-E Application

Design

ATC-E condensers are heavy-duty construction and designed for long trouble-free operation. Proper equipment selection, installation and maintenance is, however, necessary to ensure good unit performance. Some of the major considerations in the application of a condenser are presented below. For additional information, contact the factory.

Structural Steel Support

The method of support for EVAPCO condensers is two structural "I" beams located under the outer flanges and running the entire length of the unit. Mounting holes 19mm in diameter, are located in the bottom channels 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 to within 1.5mm in 1m before setting the unit in place. Do not level the unit by shimming between it and the "I" beams as this will not provide proper longitudinal support.

NOTE: Consult IBC for required steel support layout and structural design.

Air Circulation

In reviewing the system design and unit location, 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. Care must be taken when locating condensers in wells or enclosures or next to high walls. The potential for recirculation of hot, moist discharge air back into the fan intake exists. Recirculation raises the wet bulb temperature of the entering air causing the condensing pressure to rise above the design. For these cases, a discharge hood or ductwork should be provided to raise the overall unit height even with the adjacent wall, thereby reducing the chance of recirculation. Good engineering practice dictates that the evaporative condenser's discharge air not be directed or located close to or in the vicinity of building air intakes. Engineering assistance is available from the factory to identify potential recirculation problems and recommend solutions.

For additional information regarding layout of evaporative condensers, see EVAPCO Bulletin entitled "**Equipment Layout**".

Piping

Condenser piping should be designed and installed in accordance with generally accepted engineering practice. All piping should be anchored by properly designed hangers and supports with allowance made for possible expansion and contraction. No external loads should be placed upon condenser connections, nor should any of the pipe supports be anchored to the unit framework. For additional information concerning refrigerant pipe sizing and layout, see EVAPCO Bulletin entitled "**Piping Evaporative Condensers**".

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 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.

Water Treatment

A proper water treatment program is an essential part of routine maintenance in order to help assure proper operation and longevity of the unit. To help prevent the formation of "white rust", the interior of the unit should be passivated during start-up and monitored periodically as part of the water treatment program. For more information about white rust, please request a copy of EVAPCO Engineering Bulletin 36. A qualified water treatment company should be contacted to design a water treatment protocol specifically based on applicable location, water quality and unit materials of construction.

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 6.5 and 8.0. 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".**

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.

NOTE: Operating the condenser below 6.0 pH for any period of time may cause the removal of the protective zinc coating on the galvanized steel components.

For more information see EVAPCO Bulletin entitled "**Maintenance Instructions**".

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 should be undertaken. The water treatment program should be performed in conjunction with a qualified water treatment company. It is important that all internal surfaces be kept clean of accumulated dirt and sludge. In addition, the drift eliminators should be maintained in good operating condition.

Solutions for Sound Sensitive Applications

The ATC-E product line is now available with four (4) equipment options to reduce the overall sound generated from the side or top of the unit. Each option provides various levels of sound reduction and can be used in combination to provide the lowest sound level. If a detailed analysis or full octave band data sheet is required for your application, please consult your EVAPCO Sales Representative.

NOTE: These low sound options may impact the overall installed dimensions and weight of the unit.

ATC-E Mechanical Specifications

Furnish and install, as shown on the plans, an EVAPCO model _____ induced draft, counterflow evaporative condenser with a condensing capacity of _____ kW total heat of rejection when operating with _____ refrigerant at _____ °C condensing temperature with a _____ °C design wet bulb temperature.

IBC Compliance

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

Basin and Casing

The basin and casing shall be constructed of G-235 hot-dip galvanized steel for long life and durability. Standard basin accessories shall include overflow, drain, type 304 stainless steel strainers, and brass make-up valve with plastic float.

Models ATC-50E to ATC-926E (Page 14 to 25 models)

Fan Motor

_____ kW totally enclosed fan cooled motors shall be furnished suitable for outdoor service on _____ volts, _____ hertz, and _____ phase.

Motor(s) shall be mounted on an adjustable base which is accessible from the outside of the unit for service. A swing away protective cover shall shield the motor and sheave from the weather.

Drive

The fan drive shall be multigroove, solid back V-belt type with taper lock bushings designed for 150% of the motor nameplate power. The belt material shall be neoprene reinforced with polyester cord and specifically designed for evaporative condenser service. Fan sheave shall be aluminum alloy construction. The fans and the fan sheaves shall be mounted on the shaft with a specially coated bushing to provide maximum corrosion protection. Belt adjustment shall be accomplished from the exterior of the unit. Bearing lube lines shall be extended to the exterior of the unit for easy maintenance.

Models ATC-XE298E to ATC-XC1340E, ATC-428E to ATC-3714E (Page 26 to 36 models)

Fan Motor

_____ kW totally enclosed air over ball bearing fan motor(s), with 1.10 service factor shall be furnished suitable for service on _____ volts, _____ hertz, and _____ phase. Motor(s) shall be mounted on an adjustable base which allows the motor to swing to the outside of the unit for servicing.

Drive

The fan drive shall be a multigroove, solid back V-belt type with taper lock bushings designed for 150% of the motor nameplate power. The belt material shall be neoprene reinforced with polyester cord and specifically designed for evaporative condenser service. Fan and motor sheaves shall be aluminum alloy construction. The fans and fan sheaves shall be mounted on the shaft with a specially coated bushing to provide maximum corrosion protection. Belt adjustment shall be accomplished

from the exterior of the unit. Bearing lube lines shall be extended to the exterior of the unit for easy maintenance.

Axial Propeller Fans

Fans shall be heavy duty axial propeller type statically balanced. The fans shall be constructed of aluminum alloy or fiberglass reinforced polypropylene blades, installed in a closely fitted cowl with venturi air inlet. Fan screens shall be galvanized steel mesh and frame, bolted to the fan cowl.

Fan Shaft Bearings

Fan shaft bearings shall be heavy duty self-aligning ball type with grease fittings extended to the outside of the unit. Bearings shall be designed for a minimum L-10 life of 75,000 hours.

Water Recirculation Pump

The pump(s) shall be a close-coupled, centrifugal type with mechanical seal, installed vertically at the factory to allow free drainage on shut down. _____ kW totally enclosed motor(s) shall be furnished suitable for outdoor service on _____ volts, _____ hertz, and _____ phase.

Heat Transfer Coil

Condensing coil(s) shall be all prime surface steel, encased in a steel framework and hot-dip galvanized after fabrication as a complete assembly. The coil(s) shall be designed with sloping tubes for free drainage of liquid refrigerant and shall be pneumatically tested at 2.69 MPa, under water.

Water Distribution System

The system shall provide a water flow rate of 4 l/s over each square foot of unit face area to ensure proper flooding of the coil. The spray header shall be constructed of schedule 40 polyvinyl chloride pipe for corrosion resistance. All spray branches shall be removable for cleaning. Heavy-duty ABS spray nozzles with large 32mm diameter opening and internal sludge ring to eliminate clogging. Nozzles shall be threaded into spray header to provide easy removal for maintenance.

Eliminators

The eliminators shall be constructed entirely of inert polyvinyl chloride (PVC) in easily handled sections. The eliminator design shall incorporate three changes in air direction to assure complete removal of all entrained moisture from the discharge air stream. Maximum drift rate shall be less than 0.001% of the circulating water rate.

Louvers

The louvers shall be constructed from polyvinyl chloride (PVC), and be mounted in easily removable sections for access to the pan for maintenance. The louvers shall have a minimum of two changes in air direction to prevent splashout and block direct sunlight.

Finish

All basin and casing materials shall be constructed of G-235 heavy gauge mill hot-dip galvanized steel. During fabrication, all panel edges shall be coated with a 95% pure zinc-rich compound for superior protection against corrosion.

NOTES

Dimensions, weights, and data are subject to change without notice.



OUR PRODUCTS ARE MANUFACTURED WORLDWIDE.



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