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!

evapco® for LIFE

U.S. GREEN BUILDING COUNCIL MEMBER

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

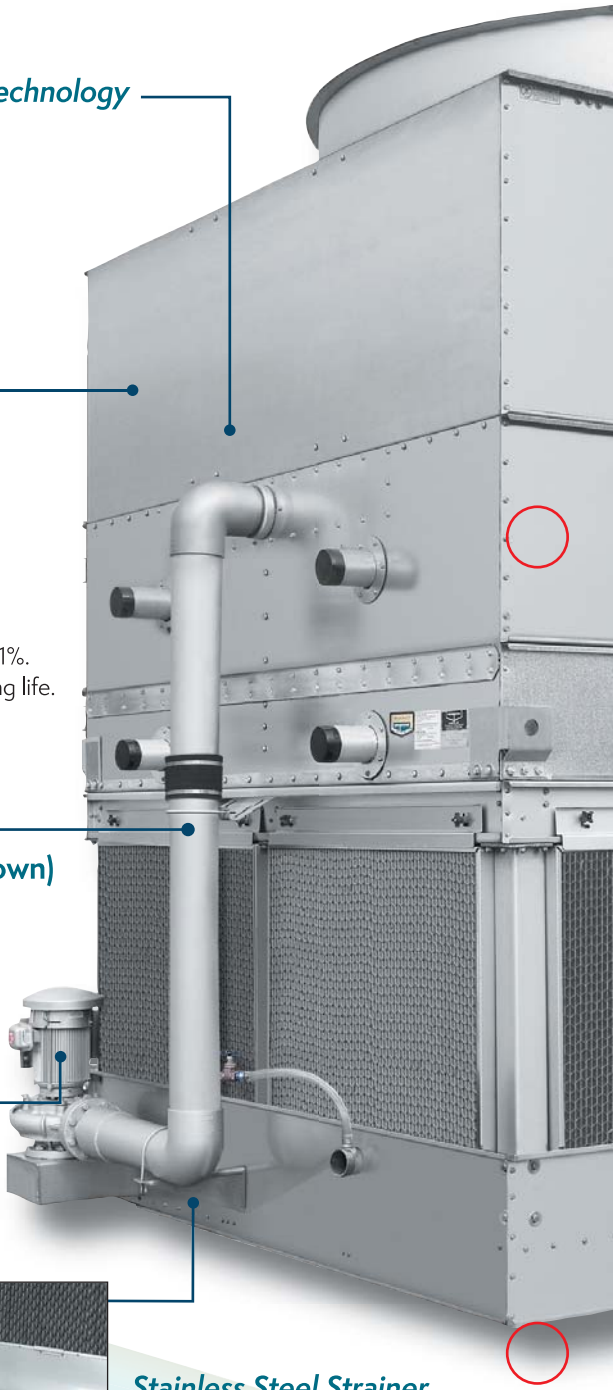
- Large orifice nozzles prevent clogging (no moving parts).
- Redesigned nozzles for superior water distribution.
- Nozzles are threaded into header at proper orientation.
- Fixed position nozzles require zero maintenance.
- Threaded end caps for ease of cleaning.
- Guaranteed for life.

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

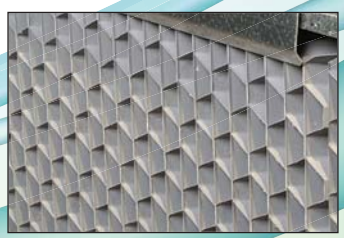
- Eliminates up to 66% of fasteners.
- Self guiding channels improve quality of field seam to eliminate leaks.
- Easy to install.
- Lower installation cost.

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.

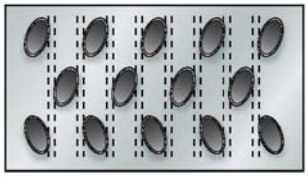
Thermal-Pak® II Coil

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 turbulance, thereby increasing heat transfer while minimizing airside pressure drop.

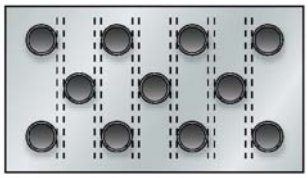
The design features of EVAPCO's Thermal-Pak® II condensing coils ensure the end user will receive the best evaporative heat transfer efficiency.

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.

ZM® II Nozzle

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 unequaled coil coverage, enhanced droplet formation and make the industries best performing maintenance-free water distribution system.

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 avaliable 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

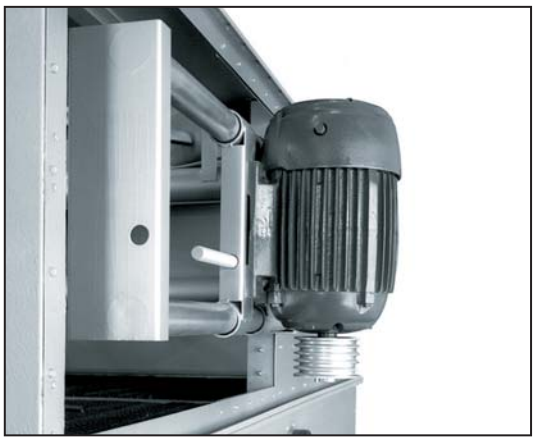
ATC-XE298E to ATC-XC1340E

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.

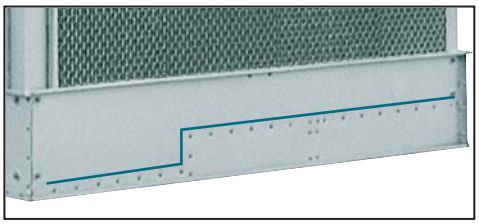
Developed with computational fluid dynamics (CFD) software and tested in EVAPCO's R&D center, the louver's air channels are optimized to maintain fluid dynamic and thermodynamic efficiency and block all line-of-sight paths into the basin eliminating splash-out; even when the fans are off. Additionally,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

Inlet Louver Design

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.

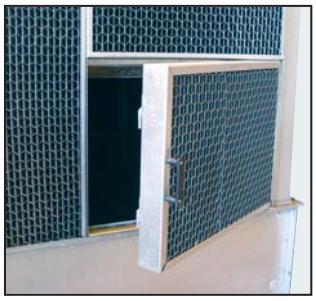
"Clean Pan" Basin Design

EVAPCO 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 thay 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	• 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.

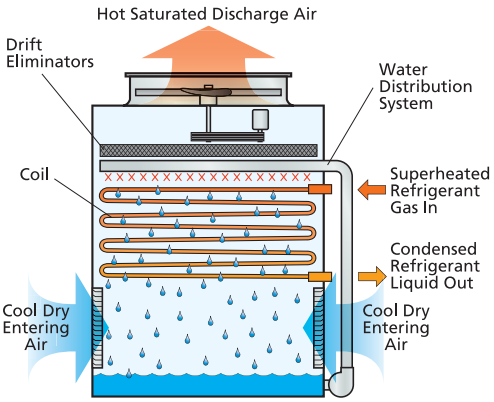
Independent Certification

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.

Principle of Operation

The refrigerant gas discharges from the compressor into the inlet connection of the ATC-E condenser. Heat from the refrigerant dissipates through the coil tubes to the water cascading downward over the tubes. Simultaneously, air is drawn in through the air inlet louvers at the base of the condenser and travels upward over the coil opposite the water flow. A small portion of the water evaporates, removing heat from the system. The warm moist air is drawn to the top of the evaporative condenser by the fan and discharged to the atmosphere. The remaining water falls to the sump at the bottom of the condenser where it recirculates through the water distribution system and back down over the coils.



NOTES:

ATC-E Selection Procedure

Two methods of selection are presented, the first is based on the total heat of rejection. The second and more simple method is based on evaporator tons. The evaporator ton method is only applicable to systems with open type reciprocating compressors.

The heat of rejection method is applicable to all but centrifugal compressor applications and is normally used for selecting evaporative condensers for use with hermetic compressors and screw compressors. It can also be used for standard open type reciprocating compressors as an alternate to the evaporator ton method.

The evaporator ton method is based on the estimated heat of compression. **The heat of rejection method of selection is more accurate and should be used whenever possible.**

Refer to the factory for selections on systems with centrifugal compressors.

Heat of Rejection Method

In the heat of rejection method, a factor for the specified operating conditions (condensing temperature and wet bulb) is obtained from Table 1 or 2 and multiplied times the heat of rejection.
The resultant figure is used to select a unit from Table 3. Unit capacities are given in Table 3.

EXAMPLE

Given: 1000 kW evaporator load, ammonia refrigerant, 36°C condensing temperature, 26°C wet bulb temperature with a 300 kW compressor.

Selection:

Evaporator Load	=	1000 kW	
Compressor Load	=	300 kW	
Total	=	1300 kW	Heat of Rejection

From Table 2, the capacity factor for 36°C condensing temperature and 26°C wet bulb temperature = 1.39

1300 (Total Heat of Rejection)	x	1.39 (Capacity Factor)	=	1807 (Corrected Heat Rejection Load)

Therefore, select ATC-423E

Note: For screw compressor selections employing water cooled oil cooling, select a condenser for the total kW as in the example. The condenser can then function in one of two ways:

(1) Recirculating water from the water sump can be used for oil cooling. A separate pump should be employed and the return water should be directed into the water sump at the opposite end from the pump suction.

(2) The condenser coil can be circuited so that water or a glycol-water mixture for the oil cooler can be cooled in a separate section of the coil. Specify load and water flow required.

For refrigerant injection cooled screw compressors, select the condenser in the same manner as shown in the example.

If the oil cooler is supplied by water from a separate source, then the oil cooling load should be deducted from the heat of rejection before making the selection.

Table 1 - R-22 and R-134a Heat Rejection Factors

Condensing Pres. (kPa)		Cond. Temp. °C	Wet Bulb Temperature (°C)																	
R-22	R-134a		10	12	14	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1090	669	30	1.07	1.15	1.25	1.38	1.47	1.57	1.69	1.83	2.00	2.23	2.50	2.86	3.36	-	-			
1154	718	32	0.94	1.01	1.09	1.19	1.26	1.32	1.40	1.49	1.60	1.74	1.90	2.11	2.36	-	-	-	-	-
1220	759	34	0.85	0.90	0.97	1.04	1.09	1.14	1.20	1.26	1.34	1.43	1.54	1.66	1.81	2.02	2.31	-	-	-
1253	785	35	0.80	0.85	0.91	0.97	1.02	1.06	1.11	1.15	1.21	1.29	1.37	1.46	1.56	1.71	1.89	2.13	2.41	2.77
1287	814	36	0.77	0.81	0.86	0.92	0.96	1.00	1.04	1.07	1.13	1.19	1.26	1.34	1.43	1.56	1.71	1.90	2.14	2.43
1359	856	38	0.70	0.74	0.78	0.82	0.85	0.86	0.90	0.93	0.96	1.01	1.06	1.11	1.18	1.26	1.35	1.47	1.62	1.78
1431	915	40	0.65	0.67	0.70	0.73	0.76	0.78	0.80	0.83	0.86	0.89	0.93	0.97	1.02	1.08	1.14	1.22	1.32	1.44
1508	978	42	0.59	0.62	0.64	0.67	0.68	0.70	0.72	0.74	0.77	0.80	0.83	0.86	0.89	0.94	0.98	1.04	1.11	1.19
1587	1026	44	0.54	0.56	0.59	0.61	0.62	0.63	0.65	0.66	0.68	0.70	0.73	0.75	0.78	0.82	0.85	0.89	0.92	0.97

Table 2 - Ammonia (R-717) Heat Rejection Factors

Condensing Pres. (kPa)	Cond. Temp. °C	Wet Bulb Temperature (°C)																	
		10	12	14	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1063	30	0.95	1.03	1.12	1.23	1.31	1.40	1.51	1.63	1.79	1.99	2.24	2.56	3.00	-	-	-	-	-
1133	32	0.84	0.90	0.97	1.06	1.12	1.18	1.25	1.32	1.43	1.55	1.70	1.88	2.11	-	-	-	-	-
1206	34	0.76	0.81	0.86	0.93	0.98	1.02	1.07	1.12	1.19	1.28	1.36	1.48	1.61	1.80	2.06	-	-	-
1245	35	0.71	0.76	0.81	0.87	0.91	0.95	0.99	1.03	1.08	1.15	1.23	1.30	1.39	1.53	1.69	1.90	2.15	2.47
1284	36	0.69	0.73	0.77	0.82	0.86	0.89	0.92	0.96	1.01	1.07	1.13	1.20	1.28	1.39	1.53	1.70	1.91	2.17
1365	38	0.63	0.66	0.69	0.73	0.76	0.78	0.81	0.83	0.86	0.90	0.94	0.99	1.05	1.12	1.21	1.31	1.44	1.59
1451	40	0.58	0.60	0.62	0.65	0.67	0.70	0.72	0.74	0.76	0.80	0.83	0.87	0.91	0.96	1.02	1.09	1.18	1.29
1539	42	0.53	0.55	0.57	0.60	0.61	0.63	0.64	0.66	0.68	0.71	0.74	0.76	0.80	0.84	0.88	0.93	0.99	1.06
1630	44	0.49	0.50	0.52	0.54	0.56	0.56	0.58	0.59	0.61	0.63	0.65	0.67	0.70	0.73	0.76	0.79	0.83	0.86

Table 3 - Unit Heat Rejection

ATC & ATC-X Models													
Model	kW Base	Model	kW Base	Model	kW Base	Model	kW Base	Model	kW Base	Model	kW Base	Model	kW Base
ATC-50E	215	ATC-351E	1512	ATC-473E	2036	ATC-632E	2722	ATC-816E	3516	ATC-979E	4218	ATC-1495E	6438
ATC-65E	280	ATC-355E	1529	ATC-474E	2043	ATC-639E	2752	ATC-817E	3519	ATC-980E	4221	ATC-1496E	6443
ATC-80E	345	ATC-XE356E	1533	ATC-481E	2072	ATC-XC641E	2761	ATC-818E	3523	ATC-XE984E	4238	ATC-1561E	6726
ATC-90E	388	ATC-358E	1544	ATC-482E	2076	ATC-642E	2765	ATC-827E	3563	ATC-1003E	4320	ATC-1562E	6728
ATC-105E	452	ATC-XC360E	1551	ATC-486E	2092	ATC-643E	2769	ATC-828E	3566	ATC-1004E	4324	ATC-1616E	6962
ATC-120E	517	ATC-361E	1555	ATC-XE492E	2119	ATC-647E	2785	ATC-830E	3574	ATC-1006E	4333	ATC-1625E	6997
ATC-135E	582	ATC-362E	1559	ATC-501E	2158	ATC-XE665E	2864	ATC-831E	3579	ATC-1007E	4337	ATC-1654E	7126
ATC-150E	646	ATC-XE368E	1585	ATC-503E	2166	ATC-666E	2869	ATC-832E	3583	ATC-XC1011E	4355	ATC-1655E	7128
ATC-165E	711	ATC-369E	1591	ATC-504E	2171	ATC-XC669E	2881	ATC-842E	3626	ATC-XE1032E	4445	ATC-1708E	7356
ATC-170E	732	ATC-371E	1598	ATC-XC504E	2171	ATC-674E	2903	ATC-843E	3631	ATC-1043E	4492	ATC-1709E	7361
ATC-181E	780	ATC-379E	1632	ATC-508E	2186	ATC-675E	2908	ATC-844E	3635	ATC-1044E	4497	ATC-1720E	7408
ATC-187E	806	ATC-383E	1650	ATC-XE516E	2222	ATC-676E	2912	ATC-851E	3665	ATC-1046E	4506	ATC-1729E	7445
ATC-193E	831	ATC-385E	1659	ATC-521E	2244	ATC-679E	2923	ATC-854E	3678	ATC-1047E	4510	ATC-1783E	7681
ATC-199E	859	ATC-387E	1667	ATC-522E	2248	ATC-682E	2938	ATC-XC855E	3683	ATC-XC1049E	4518	ATC-1784E	7684
ATC-204E	879	ATC-XE387E	1667	ATC-523E	2253	ATC-687E	2958	ATC-857E	3689	ATC-1077E	4641	ATC-1795E	7733
ATC-208E	896	ATC-XC388E	1671	ATC-XC525E	2261	ATC-701E	3019	ATC-858E	3696	ATC-1078E	4643	ATC-1805E	7772
ATC-211E	909	ATC-392E	1687	ATC-526E	2265	ATC-702E	3023	ATC-865E	3727	ATC-1085E	4671	ATC-1851E	7974
ATC-218E	937	ATC-398E	1714	ATC-527E	2272	ATC-703E	3029	ATC-869E	3741	ATC-XC1112E	4789	ATC-1861E	8015
ATC-220E	948	ATC-XC402E	1731	ATC-528E	2274	ATC-706E	3041	ATC-879E	3786	ATC-1117E	4811	ATC-1879E	8095
ATC-221E	950	ATC-XE406E	1749	ATC-XE528E	2274	ATC-XE709E	3054	ATC-880E	3790	ATC-1118E	4815	ATC-1915E	8249
ATC-225E	969	ATC-407E	1753	ATC-539E	2320	ATC-710E	3057	ATC-XC884E	3808	ATC-XC1153E	4966	ATC-1925E	8290
ATC-227E	978	ATC-408E	1757	ATC-XE542E	2334	ATC-713E	3069	ATC-887E	3822	ATC-XE1157E	4983	ATC-2002E	8623
ATC-233E	1004	ATC-409E	1760	ATC-545E	2347	ATC-XC720E	3101	ATC-892E	3840	ATC-1163E	5008	ATC-2082E	8967
ATC-236E	1016	ATC-415E	1788	ATC-XE553E	2382	ATC-723E	3114	ATC-895E	3856	ATC-1164E	5014	ATC-2158E	9295
ATC-238E	1025	ATC-416E	1792	ATC-556E	2394	ATC-724E	3118	ATC-XE896E	3859	ATC-1166E	5021	ATC-2223E	9574
ATC-241E	1038	ATC-421E	1813	ATC-557E	2399	ATC-725E	3123	ATC-XC897E	3863	ATC-1167E	5026	ATC-2256E	9716
ATC-246E	1060	ATC-422E	1817	ATC-XC558E	2403	ATC-XE742E	3196	ATC-899E	3872	ATC-1191E	5128	ATC-2320E	9991
ATC-247E	1064	ATC-423E	1824	ATC-559E	2406	ATC-746E	3215	ATC-900E	3876	ATC-1192E	5134	ATC-2324E	10008
ATC-251E	1081	ATC-XC427E	1839	ATC-563E	2425	ATC-747E	3219	ATC-907E	3906	ATC-1203E	5181	ATC-2404E	10353
ATC-253E	1090	ATC-428E	1845	ATC-564E	2429	ATC-750E	3231	ATC-912E	3930	ATC-1204E	5186	ATC-2490E	10725
ATC-258E	1112	ATC-439E	1891	ATC-578E	2491	ATC-755E	3250	ATC-913E	3932	ATC-XC1210E	5212	ATC-2509E	10805
ATC-261E	1124	ATC-441E	1900	ATC-XC579E	2494	ATC-771E	3321	ATC-918E	3954	ATC-XC1222E	5263	ATC-2647E	11399
ATC-264E	1137	ATC-442E	1902	ATC-581E	2504	ATC-772E	3325	ATC-919E	3958	ATC-1239E	5337	ATC-2765E	11909
ATC-269E	1159	ATC-XC443E	1908	ATC-583E	2510	ATC-XC775E	3338	ATC-920E	3963	ATC-1240E	5341	ATC-2855E	12295
ATC-280E	1207	ATC-XE448E	1930	ATC-XE596E	2567	ATC-778E	3352	ATC-XC925E	3984	ATC-XC1264E	5444	ATC-2900E	12491
ATC-282E	1214	ATC-450E	1938	ATC-598E	2575	ATC-780E	3360	ATC-926E	3990	ATC-XC1282E	5522	ATC-3029E	13048
ATC-294E	1268	ATC-453E	1951	ATC-601E	2591	ATC-781E	3363	ATC-935E	4028	ATC-1283E	5526	ATC-3210E	13824
ATC-XE298E	1284	ATC-456E	1965	ATC-607E	2614	ATC-782E	3369	ATC-943E	4062	ATC-1284E	5530	ATC-3232E	13923
ATC-304E	1309	ATC-457E	1967	ATC-608E	2619	ATC-791E	3407	ATC-944E	4066	ATC-1293E	5570	ATC-3313E	14271
ATC-305E	1315	ATC-460E	1981	ATC-XE608E	2619	ATC-800E	3445	ATC-XE947E	4079	ATC-1294E	5573	ATC-3336E	14366
ATC-316E	1361	ATC-462E	1990	ATC-609E	2621	ATC-XC804E	3463	ATC-949E	4087	ATC-XC1340E	5772	ATC-3459E	14901
ATC-325E	1400	ATC-XC462E	1990	ATC-XC611E	2632	ATC-805E	3466	ATC-950E	4092	ATC-1364E	5876	ATC-3482E	14998
ATC-XE333E	1434	ATC-471E	2029	ATC-620E	2668	ATC-806E	3472	ATC-963E	4148	ATC-1365E	5879	ATC-3591E	15465
ATC-338E	1456	ATC-472E	2033	ATC-630E	2713	ATC-809E	3484	ATC-964E	4152	ATC-1425E	6138	ATC-3714E	15997
ATC-XC346E	1490	ATC-XE472E	2033	ATC-631E	2718	ATC-XE812E	3497	ATC-967E	4166	ATC-1426E	6142		

Note: Table 3 presents only the standard model selections. Other models exist for special fan power or layout applications. Please consult the factory or EVAPCO Representative for the special situations.

ATC-E Selection Procedure

Evaporator Ton Method

In the evaporator ton method, factors for the specified operating conditions (suction temperature, condensing temperature and wet bulb) are obtained from either Table 5 or 6 and multiplied times the heat load in tons. The resultant figure is used to select a unit from Table 4. The condenser model in Table 4 is equal to the unit capacity in evaporator tons for R-22 or R-134a conditions of 40.6°C (105°F) condensing, 4.4°C (40°F) suction and 25.6°C (78°F) wet bulb.

EXAMPLE

Given: 300 ton evaporator load, R-717, condensing at 35°C (95°F), with -12.2°C (+10°F) suction and 24.4°C (76°F) wet bulb temperatures.

Selection: The capacity factor from Table 6 for the given condensing and wet bulb conditions is 1.38, and the capacity factor for the suction temperature of -12.2°C (+10°F) is 1.03, so the corrected capacity required may be determined as:

300 X 1.38 X 1.03 = 426 corrected tons. Therefore, select a model ATC-442E or ATC-XC443E depending on unit type desired, and any layout or horsepower considerations.

Table 4 - Unit Sizes

ATC & ATC-X Models[1]							
ATC-50E	ATC-316E	ATC-450E	ATC-578E	ATC-725E	ATC-XC884E	ATC-1078E	ATC-1720E
ATC-65E	ATC-325E	ATC-453E	ATC-XC579E	ATC-XE742E	ATC-887E	ATC-1085E	ATC-1729E
ATC-80E	ATC-XE333E	ATC-456E	ATC-581E	ATC-746E	ATC-892E	ATC-XC1112E	ATC-1783E
ATC-90E	ATC-338E	ATC-457E	ATC-583E	ATC-747E	ATC-895E	ATC-1117E	ATC-1784E
ATC-105E	ATC-XC346E	ATC-460E	ATC-XE596E	ATC-750E	ATC-XE896E	ATC-1118E	ATC-1795E
ATC-120E	ATC-351E	ATC-462E	ATC-598E	ATC-755E	ATC-XC897E	ATC-XC1153E	ATC-1805E
ATC-135E	ATC-355E	ATC-XC462E	ATC-601E	ATC-771E	ATC-899E	ATC-XE1157E	ATC-1851E
ATC-150E	ATC-XE356E	ATC-471E	ATC-607E	ATC-772E	ATC-900E	ATC-1163E	ATC-1861E
ATC-165E	ATC-358E	ATC-472E	ATC-608E	ATC-XC775E	ATC-907E	ATC-1164E	ATC-1879E
ATC-170E	ATC-XC360E	ATC-XE472E	ATC-XE608E	ATC-778E	ATC-912E	ATC-1166E	ATC-1915E
ATC-181E	ATC-361E	ATC-473E	ATC-609E	ATC-780E	ATC-913E	ATC-1167E	ATC-1925E
ATC-187E	ATC-362E	ATC-474E	ATC-XC611E	ATC-781E	ATC-918E	ATC-1191E	ATC-2002E
ATC-193E	ATC-XE368E	ATC-481E	ATC-620E	ATC-782E	ATC-919E	ATC-1192E	ATC-2082E
ATC-199E	ATC-369E	ATC-482E	ATC-630E	ATC-791E	ATC-920E	ATC-1203E	ATC-2158E
ATC-204E	ATC-371E	ATC-486E	ATC-631E	ATC-800E	ATC-XC925E	ATC-1204E	ATC-2223E
ATC-208E	ATC-379E	ATC-XE492E	ATC-632E	ATC-XC804E	ATC-926E	ATC-XC1210E	ATC-2256E
ATC-211E	ATC-383E	ATC-501E	ATC-639E	ATC-805E	ATC-935E	ATC-XC1222E	ATC-2320E
ATC-218E	ATC-385E	ATC-503E	ATC-XC641E	ATC-806E	ATC-943E	ATC-1239E	ATC-2324E
ATC-220E	ATC-387E	ATC-504E	ATC-642E	ATC-809E	ATC-944E	ATC-1240E	ATC-2404E
ATC-221E	ATC-XE387E	ATC-XC504E	ATC-643E	ATC-XE812E	ATC-XE947E	ATC-XC1264E	ATC-2490E
ATC-225E	ATC-XC388E	ATC-508E	ATC-647E	ATC-816E	ATC-949E	ATC-XC1282E	ATC-2509E
ATC-227E	ATC-392E	ATC-XE516E	ATC-XE665E	ATC-817E	ATC-950E	ATC-1283E	ATC-2647E
ATC-233E	ATC-398E	ATC-521E	ATC-666E	ATC-818E	ATC-963E	ATC-1284E	ATC-2765E
ATC-236E	ATC-XC402E	ATC-522E	ATC-XC669E	ATC-827E	ATC-964E	ATC-1293E	ATC-2855E
ATC-238E	ATC-XE406E	ATC-523E	ATC-674E	ATC-828E	ATC-967E	ATC-1294E	ATC-2900E
ATC-241E	ATC-407E	ATC-XC525E	ATC-675E	ATC-830E	ATC-979E	ATC-XC1340E	ATC-3029E
ATC-246E	ATC-408E	ATC-526E	ATC-676E	ATC-831E	ATC-980E	ATC-1364E	ATC-3210E
ATC-247E	ATC-409E	ATC-527E	ATC-679E	ATC-832E	ATC-XE984E	ATC-1365E	ATC-3232E
ATC-251E	ATC-415E	ATC-528E	ATC-682E	ATC-842E	ATC-1003E	ATC-1425E	ATC-3313E
ATC-253E	ATC-416E	ATC-XE528E	ATC-687E	ATC-843E	ATC-1004E	ATC-1426E	ATC-3336E
ATC-258E	ATC-421E	ATC-539E	ATC-701E	ATC-844E	ATC-1006E	ATC-1495E	ATC-3459E
ATC-261E	ATC-422E	ATC-XE542E	ATC-702E	ATC-851E	ATC-1007E	ATC-1496E	ATC-3482E
ATC-264E	ATC-423E	ATC-545E	ATC-703E	ATC-854E	ATC-XC1011E	ATC-1561E	ATC-3591E
ATC-269E	ATC-XC427E	ATC-XE553E	ATC-706E	ATC-XC855E	ATC-XE1032E	ATC-1562E	ATC-3714E
ATC-280E	ATC-428E	ATC-556E	ATC-XE709E	ATC-857E	ATC-1043E	ATC-1616E	
ATC-282E	ATC-439E	ATC-557E	ATC-710E	ATC-858E	ATC-1044E	ATC-1625E	
ATC-294E	ATC-441E	ATC-XC558E	ATC-713E	ATC-865E	ATC-1046E	ATC-1654E	
ATC-XE298E	ATC-442E	ATC-559E	ATC-XC720E	ATC-869E	ATC-1047E	ATC-1655E	
ATC-304E	ATC-XC443E	ATC-563E	ATC-723E	ATC-879E	ATC-XC1049E	ATC-1708E	
ATC-305E	ATC-XE448E	ATC-564E	ATC-724E	ATC-880E	ATC-1077E	ATC-1709E	

[1] **Note:** The condenser model in Table 4 is equal to the unit capacity in evaporator tons for R-22 or R-134a conditions of 40.6°C (105°F) condensing, 4.4°C (40°F) suction and 25.6°C (78°F) wet bulb.

Table 5 - R-22 and R-134a Capacity Factors

Condensing Pres. (kPa)		Cond. Temp. °C	Wet Bulb Temperature (°C)																	
R-22	R-134a		10	12	14	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1090	669	30	1.02	1.10	1.19	1.32	1.41	1.50	1.61	1.74	1.90	2.12	2.38	2.73	3.20	-	-	-	-	-
1154	718	32	0.91	0.97	1.05	1.15	1.21	1.28	1.35	1.43	1.55	1.67	1.83	2.03	2.27	-	-	-	-	-
1220	759	34	0.82	0.88	0.94	1.01	1.06	1.11	1.16	1.22	1.30	1.39	1.50	1.62	1.75	1.96	2.24	-	-	-
1253	785	35	0.78	0.83	0.89	0.95	0.99	1.03	1.08	1.12	1.18	1.26	1.34	1.43	1.52	1.67	1.85	2.08	2.35	2.70
1287	814	36	0.75	0.80	0.85	0.90	0.94	0.98	1.01	1.05	1.11	1.17	1.24	1.32	1.40	1.53	1.68	1.86	2.09	2.38
1359	856	38	0.69	0.73	0.77	0.81	0.84	0.87	0.89	0.92	0.96	1.00	1.05	1.10	1.17	1.25	1.34	1.45	1.60	1.76
1431	915	40	0.64	0.67	0.70	0.73	0.75	0.78	0.80	0.83	0.86	0.89	0.93	0.97	1.01	1.07	1.14	1.22	1.32	1.44
1508	978	42	0.60	0.62	0.64	0.67	0.69	0.71	0.73	0.75	0.77	0.80	0.83	0.86	0.90	0.94	0.99	1.05	1.11	1.19

Suction Temp. °C		-28.9	-23.3	-17.8	-12.2	-6.7	-1.1	4.4	10.0
Suction Press. (kPa)	R-22	69.6	113.8	165.5	226.1	296.5	378.5	472.3	579.2
	R-134a	-12.4	13.1	44.8	82.0	126.9	180.0	241.3	313.0
Capacity Factor		1.22	1.17	1.13	1.09	1.06	1.03	1.00	0.97

Table 6 - Ammonia (R-717) Capacity Factors

Condensing Pres. (kPa)	Cond. Temp. °C	Wet Bulb Temperature (°C)																	
		10	12	14	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1063	30	0.96	1.03	1.12	1.24	1.32	1.41	1.52	1.65	1.80	2.00	2.25	2.57	3.02	-	-	-	-	-
1133	32	0.85	0.92	0.99	1.08	1.14	1.20	1.27	1.35	1.45	1.57	1.72	1.91	2.14	-	-	-	-	-
1206	34	0.78	0.83	0.88	0.95	1.00	1.05	1.10	1.15	1.22	1.31	1.41	1.52	1.66	1.85	2.11	-	-	-
1245	35	0.74	0.78	0.83	0.89	0.94	0.98	1.02	1.06	1.11	1.19	1.27	1.34	1.44	1.58	1.75	1.96	2.22	2.56
1284	36	0.71	0.75	0.80	0.85	0.89	0.92	0.96	0.99	1.04	1.10	1.17	1.24	1.32	1.43	1.57	1.75	1.97	2.24
1365	38	0.65	0.69	0.72	0.76	0.79	0.82	0.84	0.86	0.90	0.94	0.98	1.03	1.10	1.17	1.26	1.37	1.51	1.66
1451	40	0.60	0.63	0.66	0.69	0.71	0.74	0.76	0.77	0.80	0.84	0.88	0.92	0.95	1.01	1.07	1.15	1.24	1.35
1539	42	0.56	0.58	0.60	0.63	0.65	0.67	0.69	0.70	0.73	0.76	0.78	0.81	0.84	0.89	0.94	0.99	1.05	1.12

Suction Temp. °C	-34.4	-28.9	-23.3	-17.8	-12.2	-6.7	-1.1	4.4
Suction Press. (kPa)	-11.0	24.8	62.1	108.2	164.1	231.0	310.3	404.0
Capacity Factor	1.18	1.14	1.10	1.07	1.03	1.00	0.97	0.95

Note: Table 4 presents only the standard model selections. Other models exist for special horsepower or layout applications. Please consult the factory or EVAPCO Representative for the special situations.

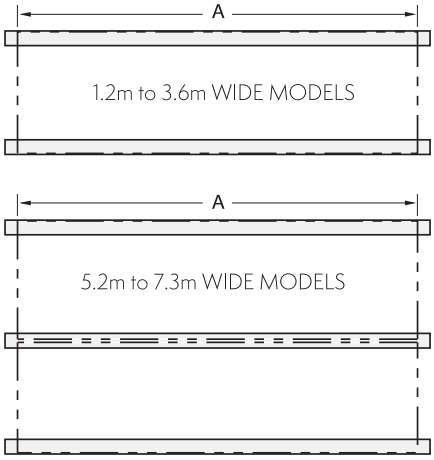
ATC-E Steel Support

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.)

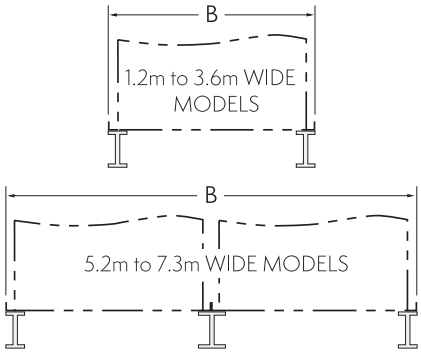
Beams should be level to within 1.5mm in 1m before setting the unit in place. Do not level the unit by shimming between it and the "I" beams as this will not provide proper longitudinal support.

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

Plan Views



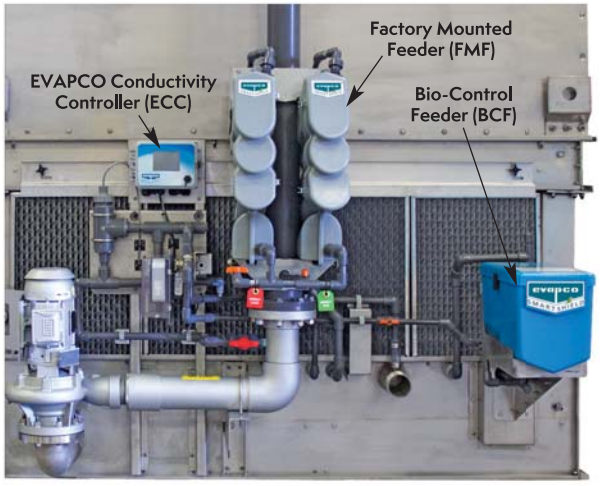
End Elevations



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 soild chemistry delivered via our revolutionary feed system. Patented controlled a 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

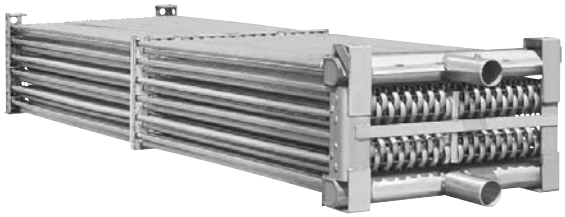
Condensers may be supplied with muliple circuit coils to match various system requirements such as split systems, or if a glycol or water circuit is desired for compressor head cooling.

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.

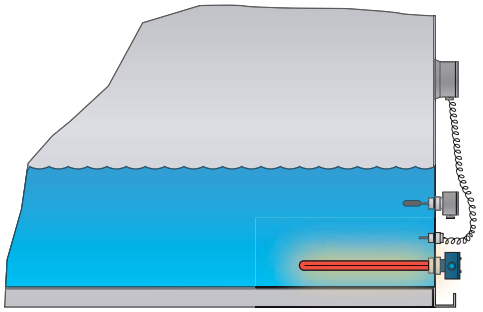
Self Supporting Service Platforms

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.

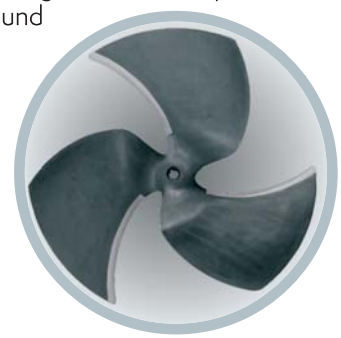


Heater Sizes (kW)			
Models	**-18˚C**	**-29˚C**	**-40˚C**
ATC-50E to 80E	3	4	5
90E to 120E	4	5	7
135E to 165E	5	7	9
181E to 261E	6	8	(2) 6
264E to 351E	8	(2) 6	(2) 8
362E to 522E	8	(2) 8	(2) 8
528E to 702E	(2) 8	(4) 6	(4) 8
724E to 1044E	(2) 8	(4) 6	(4) 8
361E to 521E	(2) 6	(2) 8	(4) 6
526E to 701E	(2) 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 independant 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.

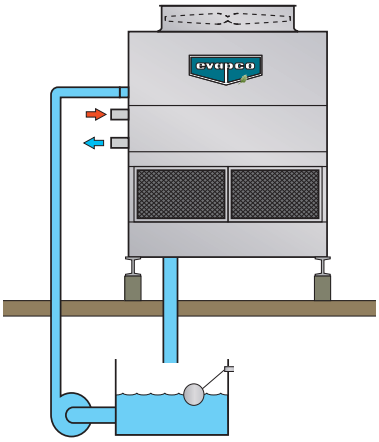
Motor Davit

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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Bulletin 153E - 10/20

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