Bulletin 167A

evapco®

CONTAINERIZED

ATC Evaporative Condensers
ATWB Closed Circuit Coolers
AT Cooling Towers

Engineered to Deliver the
Maximum Capacity and
Highest Quality to the
Worldwide Market - with the
Lowest Shipping Costs!

U.S. GREEN BUILDING COUNCIL MEMBER

IARW International Association of Refrigerated Warehouses

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

Since its founding in 1976, EVAPCO, Incorporated has become an industry leader in the engineering and manufacturing of quality heat transfer products around the world. EVAPCO's mission is to provide first class service and quality products for the following markets:

- Industrial Refrigeration
- Commercial HVAC
- Industrial Process
- Power

EVAPCO's powerful combination of financial strength and technical expertise has established the company as a recognized manufacturer of market-leading products on a worldwide basis. EVAPCO is also recognized for the superior technology of their environmentally friendly product innovations in sound reduction and water management.

EVAPCO is an employee owned company with a strong emphasis on research & development and modern manufacturing plants. EVAPCO has earned a reputation for technological innovation and superior product quality by featuring products that are designed to offer these operating advantages:

- Higher System Efficiency
- Environmentally Friendly
- Lower Annual Operating Costs
- Reliable, Simple Operation and Maintenance

With an ongoing commitment to Research & Development programs, EVAPCO provides the most advanced products in the industry–***Technology for the Future, Available Today***!

EVAPCO products are manufactured in 22 locations in 10 countries around the world and supplied through a sales network consisting of over 170 offices.

Advanced Technology Towers, Coolers & Condensers for a Worldwide Market

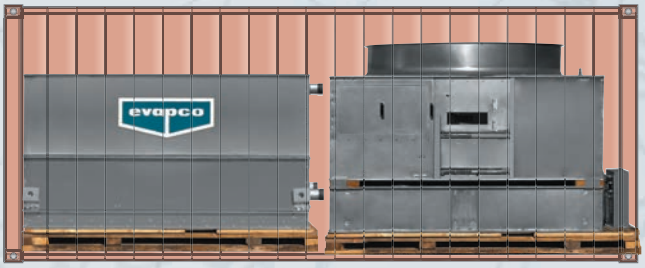
The Containerized line of Cooling Towers, Evaporative Condensers & Closed Circuit Coolers has been custom-engineered to ship in standard shipping containers. This feature greatly reduces the transportation costs associated with shipping. Customers around the world will benefit from the Advanced Technology features which are standard on the Containerized design:

- Low-Energy Consumption
- Induced-Draft Operation
- Thermal-Pak® Coils
- ZM® Nozzles
- EvapJet™ Nozzles
- PVC Water Distribution System
- WST Air Inlet Louvers
- Simple Operation and Maintenance

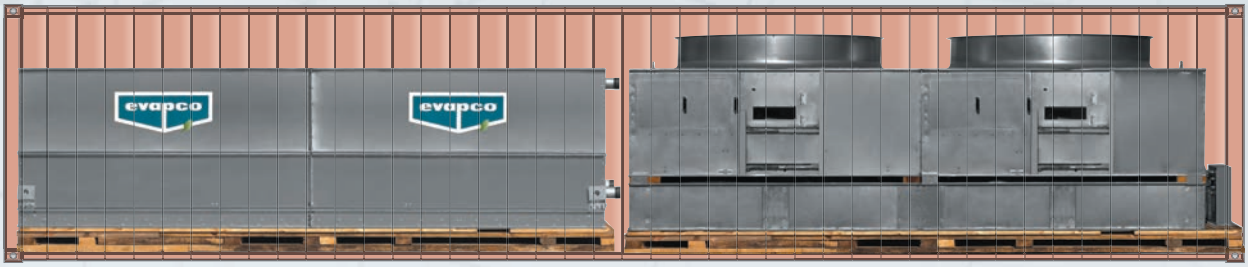
The Containerized Towers, Coolers & Condensers have been designed for simplified field assembly and rigging, while delivering the quality and reliability of a factory-built unit. These units provide the maximum capacity with the lowest ocean shipping cost!

Designed to Lower Transportation and Installation Costs while Delivering Advanced Technology, Superior Performance, Ease of Maintenance and Long, Trouble-Free Operation.

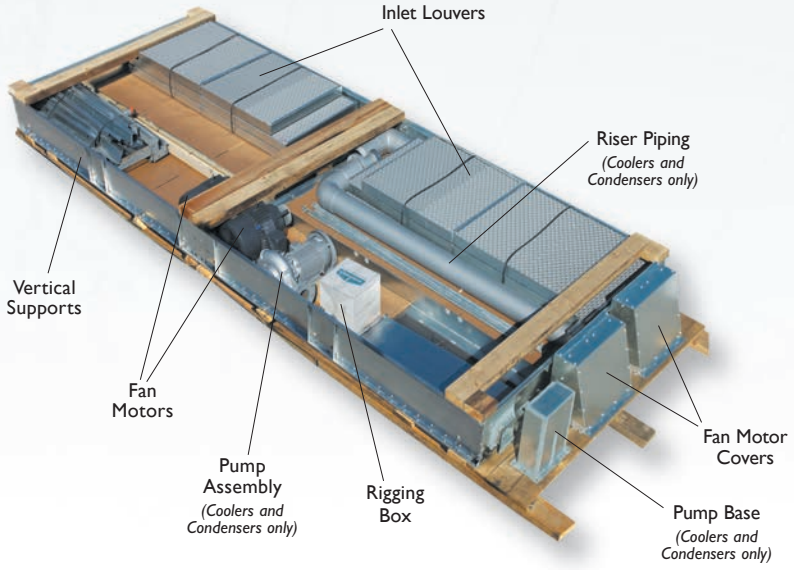
A complete 2.24M x 2.74M (7.35 ft. x 9 ft.) unit will fit in a 20' Shipping Container!



A complete 2.24M x 5.49M (7.35 ft. x 18 ft.) unit will fit in a 40' Shipping Container!



All Parts Required for Assembly Ship Inside the Basin.



Optional Accessories Ship Inside the Container

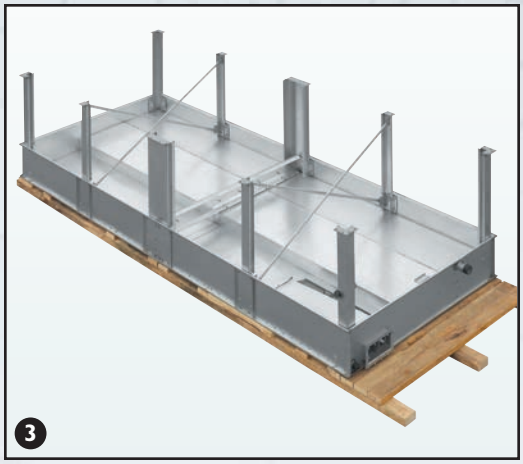
- Sloped Ladder
- Motor Davit
- Vibration Cutout Switch
- Basin Heater Package
- Electric Water Level Control
- Specialty Motors

Easy Field Assembly

(See rigging and assembly instructions for fully detailed procedure.)

Unload Unit from Container

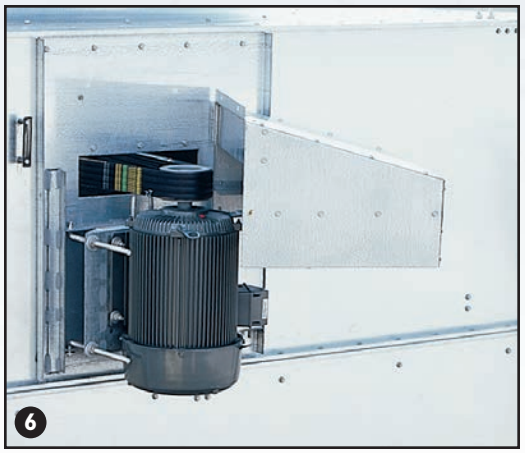
Mount Fan Section to Fill/Coil Section



Install Vertical Posts in Basin Section

Mount Fill or Coil/Fan to Basin Section

Mount Pump and Piping
(Coolers and Condensers only)



Mount Fan Motor

evapco®

cATC

Evaporative Condensers

Containerized Advanced Technology Condenser

*Up to 251 TR (178TR Ammonia) in a 20' Shipping Container!**

*Up to 504 TR (357TR Ammonia) in a 40' Shipping Container!**

Technology for the Future...Available Today!

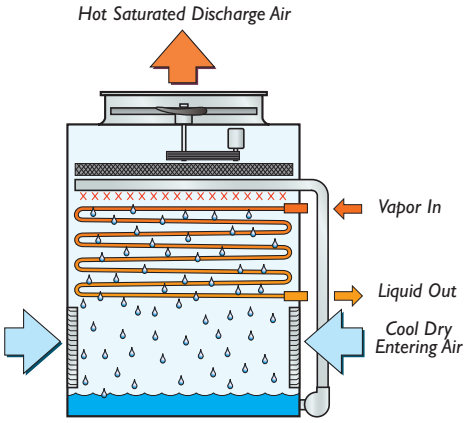
* Tons at standard conditions: HCFC-22 and HFC-134a. 40.6°C (105°F) condensing, 4.5°C (40°F) suction and 25.6°C (78°F) W.B.; ammonia 35.7°C (96.3°F) condensing, -6.7°C (20°F) suction and 25.6°C (78°F) W.B.

cATC Design and Construction Features

The cATC line of evaporative condensers reflects EVAPCO's continuing commitment to research and development. Their advanced design provides owners with many operational and performance advantages. For particularly corrosive environments, EVAPCO condensers are available with Type 304 or 316 Stainless Steel construction. Contact the factory for details on available options.

Principle of Operation

The process fluid is circulated through the coil of the evaporative condenser. Heat from the process fluid is dissipated 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 cooler and travels upward over the coil opposite the water flow. A small portion of the water is evaporated which removes the heat. The warm moist air is drawn to the top of the closed circuit cooler by the fan and is discharged to the atmosphere. The remaining water falls to the sump at the bottom of the cooler where it is recirculated by the pump up through the water distribution system and back down over the coils.

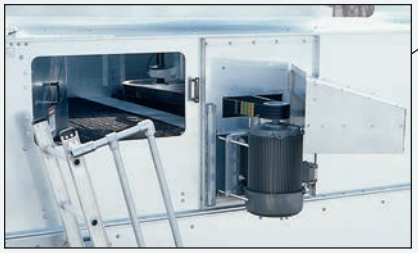


Principle of Operation

Fan Drive System

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 totally enclosed fan cooled (T.E.F.C.) fan motor is mounted on the outside for easy access. 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.


External Motor Mount (Optional Ladder Shown)

Fan Shaft Bearings

The fan shaft bearings in cATC units are specially selected for long, trouble-free life. They are rated for an L-10 life of 75,000 to 135,000 hours and are the heaviest pillow block bearings available.

Aluminum Alloy Pulleys

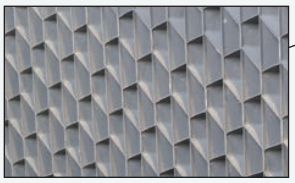
Fan pulleys located in the air stream are constructed of corrosion free aluminum for long life. The aluminum also helps belts last longer.

Power-Band Drive Belt

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

WST Air Inlet Louvers

Water and Sight Tight air inlet louvers are designed to effectively eliminate splash-out and sunlight, greatly reducing the potential for algae formation inside the condenser. They are manufactured of corrosion-free PVC and mounted in light-weight frames to allow for easy removal and convenient access to the basin section.



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.

U.S. Patent No. 6315804

PVC Drift Eliminators

EVAPCO eliminators are constructed entirely of inert, corrosion-free PVC. This patented design reduces drift rate to 0.001% and has been specially treated to resist damaging ultraviolet light. The eliminators are assembled in easily handled sections to facilitate removal, thereby exposing the upper portion of the unit and water distribution system for periodic inspection.

ZM® Nozzles

Even and constant water distribution is paramount for reliable, scale-free evaporative condensing. EVAPCO'S Zero Maintenance Spray Nozzle remains clog-free under the toughest conditions to deliver approximately 6 GPM to every square foot of coil plan area (4 lps per square meter).

The heavy-duty, fiber-reinforced ZM® spray nozzles have a 33.3 mm (1-5/16") diameter opening and a 38.1 mm (1-1/2") splash plate clearance, enabling EVAPCO to use 75% fewer nozzles. Furthermore, the fixed position ZM® Spray Nozzles are mounted in corrosion-free PVC water distribution pipes that have threaded end caps. Together, these elements combine to provide unequaled coil coverage, scale prevention and make the industry's best performing, non-corrosive, maintenance-free water distribution system.

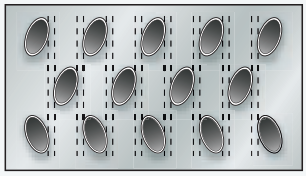
Thermal-Pak® Coil

EVAPCO's patented Thermal-Pak® condensing coils feature a design which assures maximum condensing capacity. The air flow thru the coil is counter-flow to the refrigerant flow, providing the most efficient heat transfer. This special coil design is utilized to reduce the air pressure drop through the unit while maximizing tube surface area and increasing its heat transfer capabilities. The uniquely shaped tubes of the coil are staggered in the direction of air flow to obtain a high film coefficient. In addition, all tubes are pitched in the direction of refrigerant flow assure drainage of liquid refrigerant.

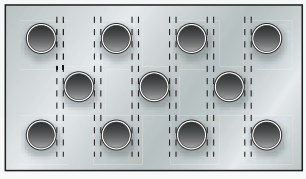
These characteristics and other engineering advancements of the Thermal-Pak® coil have been proven in EVAPCO'S world-class research and development laboratory resulting in the following end user benefits:

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

U.S. Patent No. 5799725



Thermal-Pak® Coil by EVAPCO

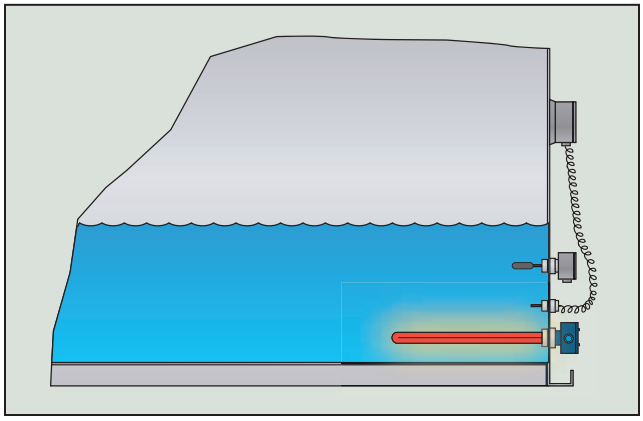


Round Tube Coil by Others

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 air pressure tested under water at 35 bar (400 psig in accordance with the "Pressure Equipment Directive" (PED) 97/23/EC in Europe). 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 430°C (800°F).

Electric Heaters

Electric immersion heaters for the condenser basin are available. They are sized to maintain a +4.4°C (+40°F) pan water temperature with the fans off and an ambient air temperature of -18°C (0°F). They are furnished with a thermostat and low water protection device to cycle the heater on when required and to prevent the heater elements from energizing unless they are completely submerged. All components are in weatherproof enclosures for outdoor use. The heater power contactors and electric wiring are not included as standard.

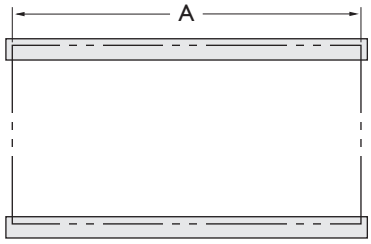


Heater Sizes			
Models	-18°C 0°F kW	-29°C -20°F kW	-40°C -40°F kW
cATC-181 to 251	7	10	15
cATC-264 to 338	8	14	18
cATC-329 to 373	10	14	20
cATC-362 to 504	12	18	24

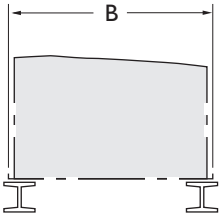
Steel Support

The recommended support for EVAPCO condensers is structural "I" beams located under the outer flanges and running the entire length of the unit. Mounting holes, 19mm (3/4") 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 3mm per 2m (1/8" per 6') 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.



Plan View



End Elevation

Models	**S.I. Units** (mm)		**English Units** (in.)	
	A	B	A	B
cATC-181 to 251	2731	2240	8' 11-1/2	7' 4-3/16
cATC-264 to 338	3651	2240	11' 11-3/4	7' 4-3/16
cATC-329 to 373	4261	2240	13' 11-3/4	7' 4-3/16
cATC-362 to 504	5486	2240	18' 0	7' 4-3/16

Selection Procedure

The following procedure is applicable to both reciprocating and screw compressors. (Refer to factory for selection on centrifugal compressors). The total heat of rejection for the system is determined by adding the evaporator load, expressed in kW or BTU/Hr, and the absorbed kW or BTU/Hr of the compressor motor. This procedure applies to both open type and hermetic compressors.

Heat of Rejection Method

Heat of Rejection = Evaporator Load (kW or BTU/Hr) + Compressor Load (kW or BTU/Hr)

The compressor load (BTU/Hr) can be calculated by one of the following formulaes:

Open Compressors:
Compressor Load (BTU/hr) = Compressor BHP x 2545

Hermetic Compressors:
Compressor Load (BTU/hr) = kW Compressor Input x 3415

Once the heat of rejection has been determined, multiply it by the factor for the specified operating conditions (condensing temperature and wet bulb temperature) obtained from either Table 1a/1b or Table 2a/2b. The resultant figure is then used to select a unit from Table 3a/3b. Unit capacities in Table 3B are given in thousands of BTU/Hr, or MBH.

Note: For screw compressor selections employing water cooled oil cooling, select a condenser for the total load (BTU/Hr or kW) as described above. The condenser can then function in one of two ways:

(1) Recirculating water from the water sump can be used directly in the oil cooler. 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.

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.

EXAMPLE - S.I. Units

Given: 500 kW evaporator load, HCFC-22 refrigerant, 35°C condensing temperature, 26°C wet bulb temperature with a 150 kW compressor.

Selection:

Evaporator Load	=	500 kW
Compressor Load	=	150 kW
Total	=	750 kW

From Table 1a the capacity factor for 35°C condensing temperature and 26°C wet bulb temperature is 1.71. Therefore, the corrected heat of rejection load is:

750 kW (Total Heat of Rejection)	x	1,71 (Capacity Factor)	=	1282.5 kW (Corrected Heat Rejection Load)

Model *c*ATC-304 is selected by using the unit heat of rejection capacities found in Table 3a.

EXAMPLE - English Units

Given: 240 ton evaporator load, ammonia (R-717) refrigerant, 95°F condensing temperature, 80°F wet bulb temperature with a 250 compressor BHP.

Selection:

Evaporator Load	=	240 tons x 12,000	=	2,880,000 BTU/Hr
Compressor Load	=	250 BHP x 2545	=	636,250 BTU/Hr
Total			=	3,516,250 BTU/Hr

From Table 2b the capacity factor for 95°F condensing temperature and 80°F wet bulb temperature is 1.63. Therefore, the corrected heat of rejection load is:

3,516.25 MBH (Total Heat of Rejection)	x	1.63 (Capacity Factor)	=	5,731.49 MBH (Corrected Heat Rejection Load)

Model *c*ATC-415 is selected by using the unit heat of rejection capacities found in Table 3b.

Table 1a - HCFC-22 and HFC-134a Heat Rejection Factors – S.I. Units

Condensing Pres. (kPa)		Cond. Temp. °C	Wet Bulb Temperature, (°C)																	
HCFC-22	HFC-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

Note: Consult factory for selections using other refrigerants.

Table 2a - Ammonia (R-717) Heat Rejection Factors – S.I. Units

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 3a - Unit Heat Rejection Capacity – S.I. Units

*c*ATC Model	kW Base
181	780
193	832
208	896
220	948
225	970
241	1,039
251	1,082
264	1,138

*c*ATC Model	kW Base
282	1,215
304	1,310
316	1,362
329	1,418
338	1,457
351	1,513
362	1,560
367	1,582

*c*ATC Model	kW Base
373	1,608
387	1,668
415	1,789
442	1,905
453	1,952
462	1,991
482	2,077
504	2,172

Table 1b - HCFC-22 and HFC-134a Heat Rejection Factors – English Units

Condensing Pres. (psig)		Cond. Temp. °F	Wet Bulb Temperature, (°F)																	
HCFC-22	HFC-134a		50	55	60	62	64	66	68	70	72	74	75	76	77	78	80	82	84	86
156	95	85	1.10	1.22	1.39	1.50	1.61	1.75	1.93	2.13	2.42	2.78	3.02	3.29	3.64	4.00	-	-	-	-
168	104	90	.93	1.02	1.14	1.21	1.28	1.36	1.45	1.57	1.71	1.89	2.00	2.12	2.25	2.38	2.85	3.50	-	-
182	114	95	.80	.87	.95	1.00	1.05	1.10	1.15	1.22	1.31	1.40	1.45	1.50	1.56	1.64	1.82	2.07	2.37	2.77
196	124	100	.71	.76	.82	.85	.88	.91	.94	.98	1.03	1.09	1.12	1.15	1.20	1.24	1.34	1.46	1.63	1.82
211	135	105	.63	.66	.70	.72	.75	.77	.80	.83	.87	.91	.93	.95	.97	1.00	1.06	1.13	1.23	1.35
226	146	110	.56	.59	.62	.64	.65	.67	.69	.71	.74	.77	.78	.80	.82	.84	.88	.93	.98	1.04

Note: Consult factory for selections using other refrigerants.

Table 2b - Ammonia (R-717) Heat Rejection Factors – English Units

Condensing Pres. (psig)	Cond. Temp. °F	Wet Bulb Temperature, (°F)																		
		50	55	60	62	64	66	68	70	72	74	75	76	77	78	80	82	84	86
152	85	.98	1.09	1.24	1.34	1.44	1.56	1.72	1.90	2.16	2.48	2.70	2.94	3.25	3.57	-	-	-	-
166	90	.83	.91	1.02	1.08	1.14	1.21	1.29	1.40	1.53	1.69	1.79	1.89	2.01	2.12	2.54	3.12	-	-
181	95	.71	.78	.85	.89	.94	.98	1.03	1.09	1.17	1.25	1.29	1.34	1.39	1.47	1.63	1.85	2.12	2.47
185	96.3	.69	.75	.82	.86	.90	.94	.98	1.03	1.10	1.18	1.22	1.26	1.31	1.37	1.51	1.71	1.94	2.25
197	100	.63	.68	.73	.76	.79	.81	.84	.87	.92	.97	1.00	1.03	1.07	1.11	1.20	1.30	1.46	1.63
214	105	.56	.59	.62	.64	.67	.69	.71	.74	.78	.81	.83	.85	.87	.89	.95	1.01	1.10	1.21
232	110	.50	.53	.55	.57	.58	.60	.62	.63	.66	.69	.70	.71	.73	.75	.79	.83	.87	.93

Table 3b - Unit Heat Rejection Capacity – English Units

*c*ATC Model	MBH Base
181	2,661
193	2,837
208	3,058
220	3,234
225	3,308
241	3,543
251	3,690
264	3,881

*c*ATC Model	MBH Base
282	4,145
304	4,469
316	4,645
329	4,836
338	4,969
351	5,160
362	5,321
367	5,395

*c*ATC Model	MBH Base
373	5,483
387	5,689
415	6,101
442	6,497
453	6,659
462	6,791
482	7,085
504	7,409

cATC Engineering Dimensions & Data – S.I. Units

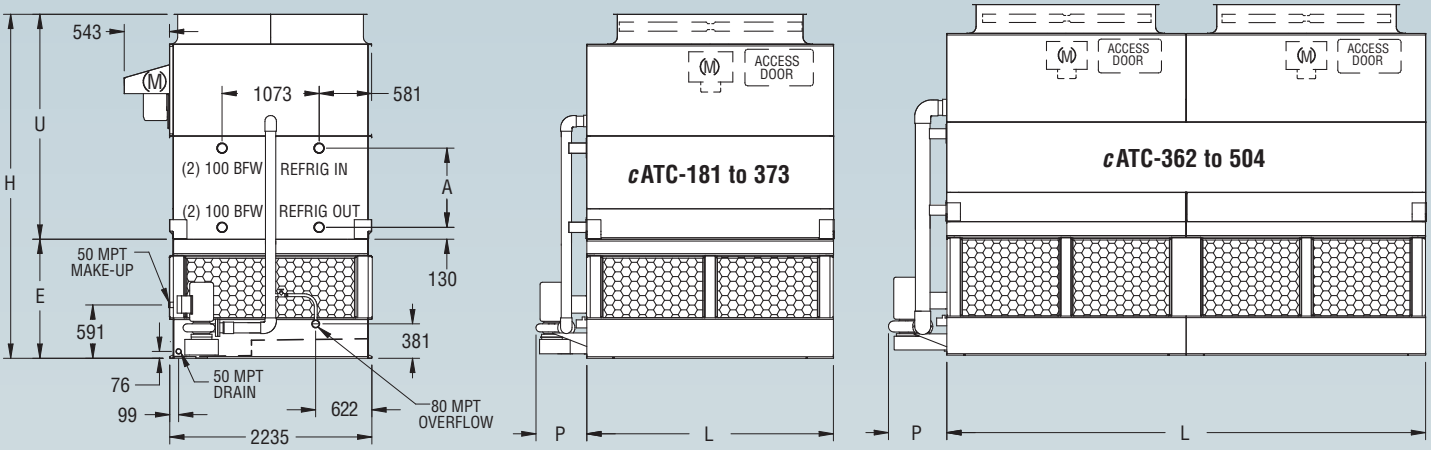


Table 1 Engineering Data

cATC Model No.*	R-717 kW*	Fans		Weights (kg)			Refrigerant Operating Charge kg***	Coil Volume (Liters)	Spray Pump		Remote Sump			Dimensions (mm)					
		KW	m³/s	Shipping	Operating	Heaviest Section†			KW	L/s	Liters Req'd**	Conn. Size (mm)	Operating Weight (kg)	Height H	Upper U	Lower E	Coil A	Length L	Pump P††
cATC-181	551	5.5	16.8	3,420	4,140	2,690	66	544	1.5	25.8	455	200	3,610	3423	2105	1318	495	2727	563
cATC-193	590	7.5	18.5	3,420	4,150	2,690	66	544	1.5	25.8	455	200	3,620	3423	2105	1318	495	2727	563
cATC-208	638	7.5	17.9	3,890	4,650	3,160	84	710	1.5	25.8	455	200	4,120	3613	2296	1318	686	2727	563
cATC-225	689	11	20.1	3,950	4,710	3,220	84	710	1.5	25.8	455	200	4,180	3613	2296	1318	686	2727	563
cATC-220	672	7.5	17.4	4,380	5,180	3,660	104	876	1.5	25.8	455	200	4,650	3804	2486	1318	876	2727	563
cATC-241	737	11	19.5	4,440	5,240	3,710	104	876	1.5	25.8	455	200	4,710	3804	2486	1318	876	2727	563
cATC-251	767	11	18.9	4,930	5,760	4,200	122	1041	1.5	25.8	455	200	5,230	3994	2677	1318	1067	2727	563
cATC-264	806	11	25.5	4,210	5,240	3,330	84	715	2.2	34.7	585	250	4,510	3423	2105	1318	495	3648	631
cATC-282	862	11	24.8	4,850	5,930	3,970	111	937	2.2	34.7	585	250	5,200	3613	2296	1318	686	3648	631
cATC-304	931	11	24.0	5,470	6,600	4,590	138	1160	2.2	34.7	585	250	5,870	3804	2486	1318	876	3648	631
cATC-316	965	15	26.0	5,500	6,630	4,620	138	1160	2.2	34.7	585	250	5,900	3804	2486	1318	876	3648	631
cATC-338	1,034	15	25.2	6,150	7,330	5,270	163	1382	2.2	34.7	585	250	6,600	3994	2677	1318	1067	3648	631
cATC-329	1,004	11	26.8	6,300	7,580	5,280	159	1349	2.2	37.8	700	250	6,760	3915	2486	1429	876	4258	617
cATC-351	1,073	15	29.1	6,320	7,610	5,310	159	1349	2.2	37.8	700	250	6,790	3915	2486	1429	876	4258	617
cATC-367	1,120	15	28.2	7,070	8,410	6,060	191	1610	2.2	37.8	700	250	7,590	4105	2677	1429	1067	4258	617
cATC-373	1,142	18.5	30.0	7,080	8,430	6,070	191	1610	2.2	37.8	700	250	7,610	4105	2677	1429	1067	4258	617
cATC-362	1,107	(2)5.5	33.8	6,340	7,920	4,950	125	1056	4	50.4	890	300	6,840	3632	2105	1527	495	5483	670
cATC-387	1,180	(2)7.5	37.1	6,350	7,940	4,960	125	1056	4	50.4	890	300	6,860	3632	2105	1527	495	5483	670
cATC-415	1,267	(2)7.5	36.0	7,310	8,970	5,910	166	1392	4	50.4	890	300	7,890	3823	2296	1527	686	5483	670
cATC-453	1,383	(2)11	40.3	7,420	9,080	6,030	166	1392	4	50.4	890	300	8,000	3823	2296	1527	686	5483	670
cATC-442	1,348	(2)7.5	34.9	8,260	10,000	6,870	204	1728	4	50.4	890	300	8,920	4013	2486	1527	876	5483	670
cATC-482	1,473	(2)11	39.1	8,380	10,120	6,990	204	1728	4	50.4	890	300	9,040	4013	2486	1527	876	5483	670
cATC-462	1,413	(2)7.5	33.8	9,240	11,050	7,850	243	2064	4	50.4	890	300	9,970	4204	2677	1527	1067	5483	670
cATC-504	1,538	(2)11	37.9	9,360	11,170	7,970	243	2064	4	50.4	890	300	10,090	4204	2677	1527	1067	5483	670

* Tons at standard conditions: HCFC-22 and HFC-134a. 40.6°C condensing, 4.5°C suction and 25.6°C W.B.; ammonia 35.7°C condensing, -6.7°C suction and 25.6°C W.B.

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

*** Refrigerant charge is shown for R-717. Multiply by 1.93 for R-22 and 1.98 for R-134a.

† Heaviest section is the coil section.

†† Pump base ships loose on models cATC-264 to 338.

Dimensions are subject to change. Do not use for pre-fabrication.

cATC Engineering Dimensions & Data – English Units

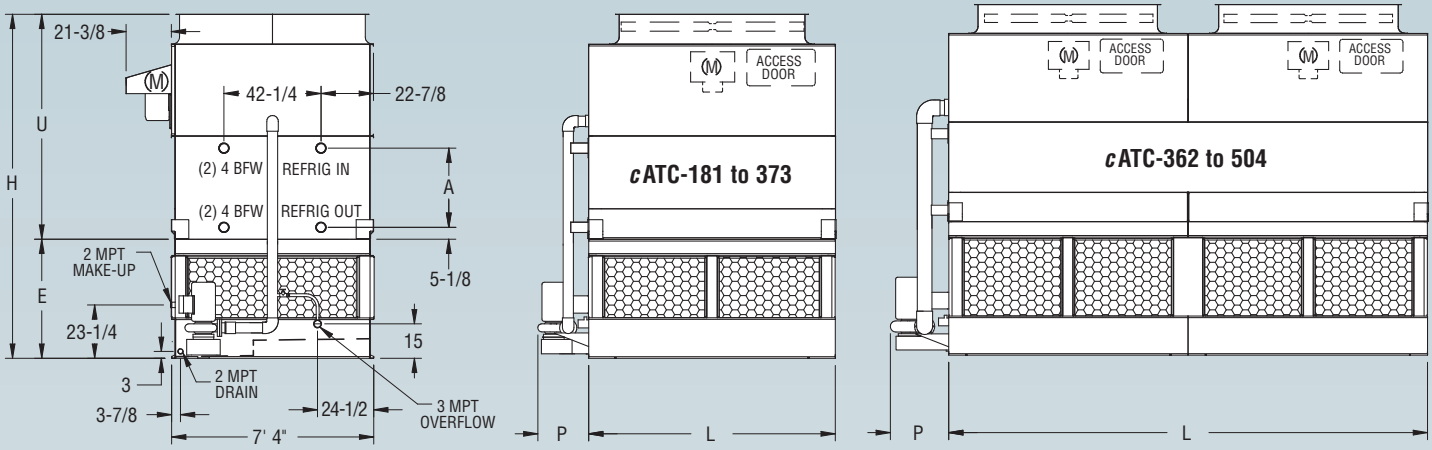


Table 1 Engineering Data

cATC Model No.*	R-717 Tons*	Fans		Weights (lbs.)			Refrigerant Operating Charge lbs.***	Coil Volume ft³	Spray Pump		Remote Sump			Dimensions (in.)					
		HP	CFM	Shipping	Operating	Heaviest Section†			HP	GPM	Gallons Req'd**	Conn. Size	Operating Weight (lbs.)	Height H	Upper U	Lower E	Coil A	Length L	Pump P††
cATC-181	128	7.5	35,830	7,530	9,130	5,930	145	19	2	410	120	8"	7,960	11' 2-3/4"	6' 10-7/8"	4' 3-7/8"	19-1/2"	8' 11-3/8"	22-1/8"
cATC-193	137	10	39,290	7,540	9,140	5,940	145	19	2	410	120	8"	7,970	11' 2-3/4"	6' 10-7/8"	4' 3-7/8"	19-1/2"	8' 11-3/8"	22-1/8"
cATC-208	148	10	38,140	8,570	10,250	6,970	185	25	2	410	120	8"	9,080	11' 10-1/4"	7' 6-3/8"	4' 3-7/8"	27"	8' 11-3/8"	22-1/8"
cATC-225	160	15	42,730	8,700	10,380	7,100	185	25	2	410	120	8"	9,210	11' 10-1/4"	7' 6-3/8"	4' 3-7/8"	27"	8' 11-3/8"	22-1/8"
cATC-220	156	10	37,000	9,660	11,420	8,060	230	31	2	410	120	8"	10,250	12' 5-3/4"	8' 1-7/8"	4' 3-7/8"	34-1/2"	8' 11-3/8"	22-1/8"
cATC-241	171	15	41,450	9,790	11,550	8,190	230	31	2	410	120	8"	10,380	12' 5-3/4"	8' 1-7/8"	4' 3-7/8"	34-1/2"	8' 11-3/8"	22-1/8"
cATC-251	178	15	40,170	10,860	12,700	9,260	270	37	2	410	120	8"	11,530	13' 1-1/4"	8' 9-3/8"	4' 3-7/8"	42"	8' 11-3/8"	22-1/8"
cATC-264	187	15	54,270	9,280	11,550	7,350	185	25	3	550	155	10"	9,940	11' 2-3/4"	6' 10-7/8"	4' 3-7/8"	19-1/2"	11' 11-5/8"	24-7/8"
cATC-282	200	15	52,690	10,690	13,070	8,760	245	33	3	550	155	10"	11,460	11' 10-1/4"	7' 6-3/8"	4' 3-7/8"	27"	11' 11-5/8"	24-7/8"
cATC-304	216	15	51,110	12,060	14,550	10,130	305	41	3	550	155	10"	12,940	12' 5-3/4"	8' 1-7/8"	4' 3-7/8"	34-1/2"	11' 11-5/8"	24-7/8"
cATC-316	224	20	55,390	12,120	14,610	10,190	305	41	3	550	155	10"	13,000	12' 5-3/4"	8' 1-7/8"	4' 3-7/8"	34-1/2"	11' 11-5/8"	24-7/8"
cATC-338	240	20	53,680	13,550	16,150	11,620	360	49	3	550	155	10"	14,540	13' 1-1/4"	8' 9-3/8"	4' 3-7/8"	42"	11' 11-5/8"	24-7/8"
cATC-329	233	15	57,120	13,880	16,720	11,650	350	48	3	600	185	10"	14,910	12' 10-1/8"	8' 1-7/8"	4' 8-1/4"	34-1/2"	13' 11-5/8"	24-1/4"
cATC-351	249	20	61,910	13,940	16,780	11,710	350	48	3	600	185	10"	14,970	12' 10-1/8"	8' 1-7/8"	4' 8-1/4"	34-1/2"	13' 11-5/8"	24-1/4"
cATC-367	260	20	60,000	15,580	18,550	13,350	420	57	3	600	185	10"	16,740	13' 5-5/8"	8' 9-3/8"	4' 8-1/4"	42"	13' 11-5/8"	24-1/4"
cATC-373	265	25	63,860	15,610	18,580	13,380	420	57	3	600	185	10"	16,770	13' 5-5/8"	8' 9-3/8"	4' 8-1/4"	42"	13' 11-5/8"	24-1/4"
cATC-362	257	(2)7.5	71,910	13,980	17,470	10,910	275	37	5	800	235	12"	15,090	11' 11"	6' 10-7/8"	5' 1/8"	19-1/2"	17' 11-7/8"	26-3/8"
cATC-387	274	(2)10	78,880	14,010	17,500	10,940	275	37	5	800	235	12"	15,120	11' 11"	6' 10-7/8"	5' 1/8"	19-1/2"	17' 11-7/8"	26-3/8"
cATC-415	294	(2)10	76,580	16,110	19,770	13,040	365	49	5	800	235	12"	17,390	12' 6-1/2"	7' 6-3/8"	5' 1/8"	27"	17' 11-7/8"	26-3/8"
cATC-453	321	(2)15	85,790	16,360	20,020	13,290	365	49	5	800	235	12"	17,640	12' 6-1/2"	7' 6-3/8"	5' 1/8"	27"	17' 11-7/8"	26-3/8"
cATC-442	313	(2)10	74,280	18,220	22,050	15,150	450	61	5	800	235	12"	19,670	13' 2"	8' 1-7/8"	5' 1/8"	34-1/2"	17' 11-7/8"	26-3/8"
cATC-482	342	(2)15	83,210	18,470	22,300	15,400	450	61	5	800	235	12"	19,920	13' 2"	8' 1-7/8"	5' 1/8"	34-1/2"	17' 11-7/8"	26-3/8"
cATC-462	328	(2)10	71,980	20,380	24,370	17,310	535	73	5	800	235	12"	21,990	13' 9-1/2"	8' 9-3/8"	5' 1/8"	42"	17' 11-7/8"	26-3/8"
cATC-504	357	(2)15	80,640	20,630	24,620	17,560	535	73	5	800	235	12"	22,240	13' 9-1/2"	8' 9-3/8"	5' 1/8"	42"	17' 11-7/8"	26-3/8"

* Tons at standard conditions: HCFC-22 and HFC-134a. 105°F condensing, 40°F suction and 78°F W.B.; ammonia 96.3°F condensing, 20°F suction and 78°F W.B.

** Gallons shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (12" would normally be sufficient.)

*** Refrigerant charge is shown for R-717. Multiply by 1.93 for R-22 and 1.98 for R-134a.

† Heaviest section is the coil section.

†† Pump base ships loose on models cATC-264 to 338.

Dimensions are subject to change. Do not use for pre-fabrication.

cATC Evaporative Condenser Specification

Furnish and install as shown on the plans an EVAPCO Model _____ induced draft counterflow evaporative condenser with a condensing capacity of _____ kW (BTUH) operating with a _____ refrigerant at _____ °C (°F) condensing temperature with a _____ °C (°F) entering wet bulb temperature.

Basin and Casing
The basin and casing shall be constructed of heavy gauge mill hot-dip galvanized steel (G-235 in U.S.A., Z-725 in Europe and Z-600 in Asia) 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.

Fan Motor
_____ kW (horsepower) totally enclosed fan cooled motors with 1.15 service factor 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 sheaves designed for 150% of the motor nameplate horsepower. The belt material shall be neoprene reinforced with polyester cord and specifically designed for evaporative cooler 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.

Axial Propeller Fans
Fans shall be heavy-duty axial propeller type statically balanced. The fans shall be constructed of aluminum alloy 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. Materials shall be stainless steel balls with chrome steel races and zinc plated housing for corrosion resistance. 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 (horsepower) totally enclosed motor(s) shall be furnished suitable for outdoor service on _____ volts, _____ hertz, and _____ phase.

Heat Transfer Coil
Cooling coil(s) shall be all prime surface steel, encased in a steel framework and hot-dip galvanized after fabrication as a complete assembly. The tubes shall be arranged in a self-spacing, staggered pattern in the direction of airflow for maximum heat transfer efficiency and minimum pressure drop, without the use of additional spacers between the coil tubes. The coil(s) shall be pneumatically tested under water at 35 bar (400 psig in accordance with "Pressure Equipment Directive" (PED) 97/23/EC in Europe).

Water Distribution System
The spray header shall be constructed of schedule 40 polyvinyl chloride pipe for corrosion resistance. All spray branches shall be removable for cleaning. The water shall be distributed over the entire coil surface by heavy-duty, fiber-reinforced spray nozzles [33.3mm (1-5/16") diameter opening and 38.1mm (1-1/2") splash plate clearance] with 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). The louvers shall be mounted in easily removable frames for access to the pan for maintenance. The louvers shall have a minimum of two changes in air direction to prevent splash out and block direct sunlight.

Finish
All basin and casing materials shall be constructed of heavy gauge mill hot-dip galvanized steel (G-235 in U.S.A., Z-725 in Europe and Z-600 in Asia). During fabrication, all panel edges shall be coated with a 95% pure zinc-rich compound for superior protection against corrosion.

evapco®

CATWB

CLOSED CIRCUIT COOLER

CTI CERTIFIED

MOTOR AND DRIVE 5 Year WARRANTY

IBC COMPLIANT DESIGNS

CONTAINERIZED ADVANCED TECHNOLOGY WATER COOLER

*Up to 143 Tons in a 20' Shipping Container!**

*Up to 334 Tons in a 40' Shipping Container!**

Technology for the Future...Available Today!

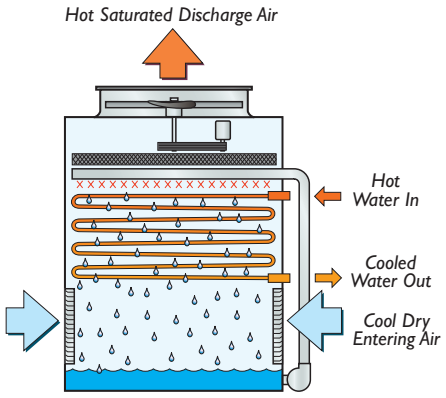
* Tons at standard conditions: 37.7°C (100°F) inlet, 32.2°C (90°F) outlet and 25.6°C (78°F) WB

cATWB Design and Construction Features

The cATWB line of closed circuit coolers reflects EVAPCO's continuing commitment to research and development. Their advanced design provides owners with many operational and performance advantages. The cATWB's Thermal-Pak® Coil now features CROSScool™ Internal Tube Enhancement which increases the internal heat transfer coefficient of the coil and thus increases the cooling capacity of the unit. For particularly corrosive environments, EVAPCO coolers are available with Type 304 or 316 Stainless Steel construction. Contact the factory for details on available options.

Principle of Operation

The process fluid is circulated through the coil of the closed circuit cooler. Heat from the process fluid is dissipated 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 cooler and travels upward over the coil opposite the water flow. A small portion of the water is evaporated which removes the heat. The warm moist air is drawn to the top of the closed circuit cooler by the fan and is discharged to the atmosphere. The remaining water falls to the sump at the bottom of the cooler where it is recirculated by the pump up through the water distribution system and back down over the coils.

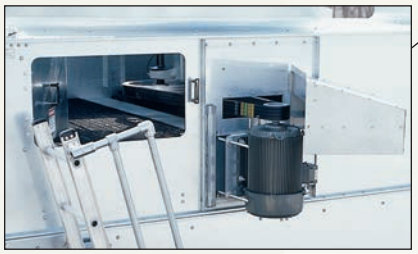


Principle of Operation

Fan Drive System

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 totally enclosed fan cooled (T.E.F.C.) fan motor is mounted on the outside for easy access. 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.


External Motor Mount (Optional Ladder Shown)

Fan Shaft Bearings

The fan shaft bearings in cATWB units are specially selected for long, trouble-free life. They are rated for an L-10 life of 75,000 to 135,000 hours and are the heaviest pillow block bearings available.

Aluminum Alloy Pulleys

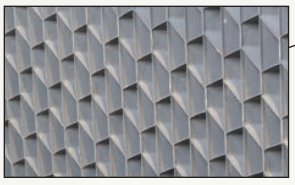
Fan pulleys located in the air stream are constructed of corrosion free aluminum for long life. The aluminum also helps belts last longer.

Power-Band Drive Belt

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

WST Air Inlet Louvers

Water and Sight Tight air inlet louvers are designed to effectively eliminate splash-out and sunlight, greatly reducing the potential for algae formation inside the cooler. They are manufactured of corrosion-free PVC and mounted in lightweight frames to allow for easy removal and convenient access to the basin section.



Type 304 Stainless Steel Strainers

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

U.S. Patent No. 6315804

PVC Drift Eliminators

EVAPCO eliminators are constructed entirely of inert, corrosion-free PVC. This patented design reduces drift rate to 0.001% and has been specially treated to resist damaging ultraviolet light. The eliminators are assembled in easily handled sections to facilitate removal, thereby exposing the upper portion of the unit and water distribution system for periodic inspection.

ZM®II Nozzles

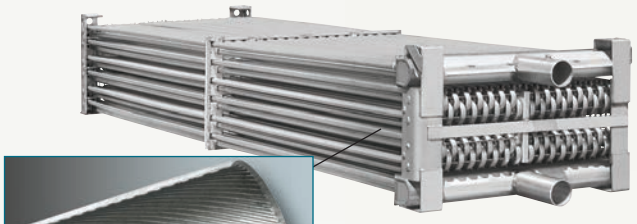
Even and constant water distribution is paramount for reliable, scale-free evaporative condensing. EVAPCO'S Zero Maintenance Spray Nozzle remains clog-free under the toughest conditions to deliver approximately 6 GPM to every square foot of coil plan area (4 lps per square meter).

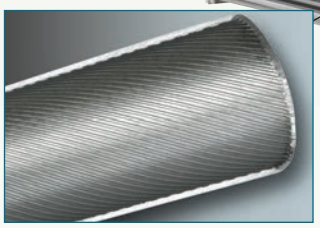
The heavy-duty, fiber-reinforced ZM®II spray nozzles have a 33.3 mm (1-5/16") diameter opening and a 38.1 mm (1-1/2") splash plate clearance, enabling EVAPCO to use 75% fewer nozzles. Furthermore, the fixed position ZM®II Spray Nozzles are mounted in corrosion-free PVC water distribution pipes that have threaded end caps. Together, these elements combine to provide unequaled coil coverage, scale prevention and make the industry's best performing, non-corrosive, maintenance-free water distribution system.

Galvanized Steel Coil

Elliptical Thermal-Pak® COIL Construction Featuring *CROSS*COOL™ Internal Tube Enhancement Technology

- Internal tube enhancement increases fluid turbulence providing additional evaporative capacity.
- Elliptical return bends allows for more circuits per coil bundle increasing maximum capacity per footprint.
- Coil located out of airstream eliminating water evaporation on the coil, reducing scale buildup potential.





CROSSCOOL™

INTERNAL TUBE ENHANCEMENT

Design

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

Air Circulation

It is important that proper air circulation be provided. The best location is on an unobstructed roof top or on ground level away from walls and other barriers. Those closed circuit coolers located in wells, enclosures or adjacent to high walls must be properly located to avoid the problems associated with recirculation.

Recirculation raises the wet bulb temperature of the entering air causing the water temperature to rise above the design. For these cases, the discharge of the fan should be located at a height even with the adjacent wall, thereby reducing the chance of recirculation. For additional information, see the EVAPCO Equipment Layout Manual.

Good engineering practice dictates that the closed circuit cooler discharge air not be directed or located close to or in the vicinity of building air intakes.

Piping

Cooler piping should be designed and installed in accordance with generally accepted engineering practices. The piping layout should be symmetrical on multiple unit systems, and sized for a reasonably low water velocity and pressure drop.

The standard closed circuit cooler is recommended only on a closed, pressurized system. The piping system should include an expansion tank to allow for fluid expansion and purging air from the system.

Note: Closed Circuit Coolers should never be used on an open type system. An open type system with a cooler may result in premature coil failure.

The piping system should be designed to permit complete drainage of the heat exchanger coil. This will require a vacuum breaker or air vent to be installed at the high point and a drain valve installed at the low point of the piping system. Both must be adequately sized.

All piping should be securely anchored by properly designed hangers and supports. No external loads should be placed upon the cooler connections, nor should any of the pipe supports be anchored to the cooler framework.

Recirculating Water System

The surest way to protect the recirculating water system from freezing is with a remote sump. The remote sump should be located inside the building and below the unit. When a remote sump arrangement is selected, the spray pump is provided by others and installed at the remote sump. All water in the closed circuit cooler basin should drain to the remote sump when the spray pump cycles off.

Other freeze protection methods are available when a remote sump is not feasible. Electric pan heaters, steam or hot water coils can be used to keep the pan water from freezing when the unit cycles off. Water lines to and from the unit, spray pump and related piping should be heat traced and insulated up to the overflow level in order to protect from freezing.

The unit should not be operated dry (fans on, pump off) unless the basin is completely drained and the unit has been designed for dry operation. Consult the factory when dry operation is a requirement.

Freeze Protection

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

Heat Exchanger Coil

The simplest and most foolproof method of protecting the heat exchanger coil from freeze-up is to use a glycol solution. If this is not possible, an auxiliary heat load must be maintained on the coil at all times so that the water temperature does not drop below 10°C (50°F) when the cooler is shut down. Heat loss data shown for each unit is based on 10°C (50°F) water in the coil, -23.3°C (-10°F) ambient and 72.4 KPH (45 MPH) winds (fan and pump off).

Heat Loss Data

Model	Standard Unit (KW)	Standard Unit (MBH)
cATWB 7-39*	56	192
cATWB 7-49*	68	232
cATWB 7-59*	76	261
cATWB 7-69*	81	278
cATWB 7-312*	75	258
cATWB 7-412*	91	312
cATWB 7-512*	103	351
cATWB 7-612*	110	375
cATWB 7-314*	89	303
cATWB 7-414*	107	365
cATWB 7-514*	121	412
cATWB 7-614*	128	438
cATWB 7-318*	115	392
cATWB 7-418*	138	473
cATWB 7-518*	156	532
cATWB 7-618*	166	568

If glycol is not used, in addition to ensuring the water temperature in the coil does not drop below 10°C (50°F) when the cooler is shut down, a minimum recommended flow rate per unit must be maintained as shown.

Minimum Flow Rate

Box Size	Minimum Flow (LPS)	Minimum Flow (GPM)
cATWB 7-9	15	240
cATWB 7-12		
cATWB 7-14		
cATWB 7-18		

Water Treatment

In some cases, the make-up water will have high impurity levels and a normal bleed will not be enough to prevent scale formation. In these cases, the services of an experienced water treatment company should be retained.

The water treatment program prescribed for the given conditions must be compatible with the unit's materials of construction, including the galvanized coil. If an acid is used to control pH, it should be accurately metered in dilute solution such that the spray water is held between a pH of 7.0 and 8.8. Batch feeding of chemicals is not recommended.

Units constructed of galvanized steel operating with circulating water having a pH of 8.3 or higher may require periodic passivation to prevent the formation of white rust. White rust is a corrosion byproduct of the protective zinc barrier and appears on the metal surface as white, waxy formations. If white rust forms and is left untreated, it may flake off and leave the bare metal substrate exposed.

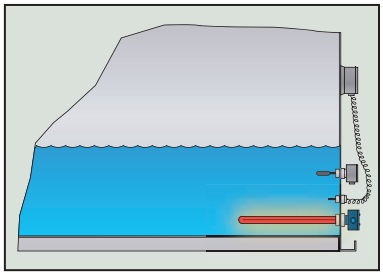
Control of Biological Contaminants

Water quality should be checked regularly for biological contamination. If biological contamination is detected, a more aggressive water treatment and mechanical cleaning program is required. The water treatment program should be performed in conjunction with a qualified water treatment company. It is important that all internal surfaces be kept clean of accumulated dirt or sludge. In addition, the drift eliminators should be kept in good operating condition to minimize water from exiting the evaporative cooling unit in the discharge air.

To minimize the risk of biological contamination, at initial start up or after an extended shut down, it is recommended that the cooler be properly treated. Clean all debris such as leaves and dirt from the unit. Completely fill the basin to the overflow level with fresh water. Initiate a biocide water treatment or shock treatment program prior to operating the unit. It is preferable that all such procedures be conducted or supervised by a water treatment specialist.

Electric Heaters

Electric immersion heaters for the cooler basin are available. They are sized to maintain a +4.4°C (+40°F) pan water temperature with the fans off and an ambient air temperature of -18°C (0°F). They are furnished with a thermostat and low water protection device to cycle the heater on when required and to prevent the heater elements from energizing unless they are completely submerged. All components are in weatherproof enclosures for outdoor use. The heater power contactors and electric wiring are not included as standard.



Heater Sizes

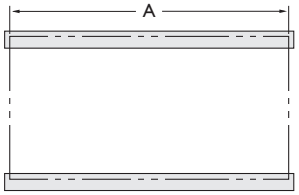
Models	-18°C 0°F kW	-29°C -20°F kW	-40°C -40°F kW
cATWB 7-9	7	10	15
cATWB 7-12	8	14	18
cATWB 7-14	10	14	20
cATWB 7-18	12	18	24

Steel Support

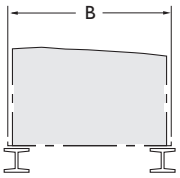
The recommended support for EVAPCO coolers is structural "I" beams located under the outer flanges and running the entire length of the unit. Mounting holes, 19mm (3/4") in diameter are located in the bottom channels of the pan section to provide for bolting to the structural steel. (Refer to certified drawings from the factory for bolt hole locations).

Beams should be level to within 3mm per 2m (1/8" per 6') 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.

Steel Support (cont.)



Plan View



End Elevation

cATWB Supporting Steel Dimensions

Models	S.I. Units (mm)		English Units (in.)	
	A	B	A	B
cATWB 7-9	2731	2240	8' 11-1/2	7' 4-3/16
cATWB 7-12	3651	2240	11' 11-3/4	7' 4-3/16
cATWB 7-14	4261	2240	13' 11-3/4	7' 4-3/16
cATWB 7-18	5486	2240	18' 0	7' 4-3/16

Nominal Flow By cATWB Model

Model	Nominal Flow** (LPS)	Nominal Flow* (GPM)
cATWB 7-3H9	15.1	239
cATWB 7-3I9	17.1	271
cATWB 7-4I9	20.4	323
cATWB 7-4J9	23.5	373
cATWB 7-5I9	22.4	355
cATWB 7-5J9	25.8	409
cATWB 7-6J9	27.0	428
cATWB 7-3J12	26.4	419
cATWB 7-4J12	31.0	492
cATWB 7-5J12	33.9	537
cATWB 7-5K12	37.0	587
cATWB 7-6K12	38.6	612
cATWB 7-5J14	37.7	597
cATWB 7-5K14	41.2	653
cATWB 7-6K14	42.8	679
cATWB 7-6L14	45.8	726
cATWB 7-3H18	38.4	609
cATWB 7-3I18	42.8	678
cATWB 7-4I18	49.5	784
cATWB 7-4J18	56.0	888
cATWB 7-5I18	53.7	851
cATWB 7-5J18	60.8	963
cATWB 7-6I18	56.0	887
cATWB 7-6J18	63.2	1002

*Nominal Conditions: 100°F inlet, 90°F outlet, and 78°F WB
** Nominal Conditions: 37.7°C inlet, 32.2°C outlet, and 25.6°C WB

cATWB Engineering Dimensions & Data – S.I. Units

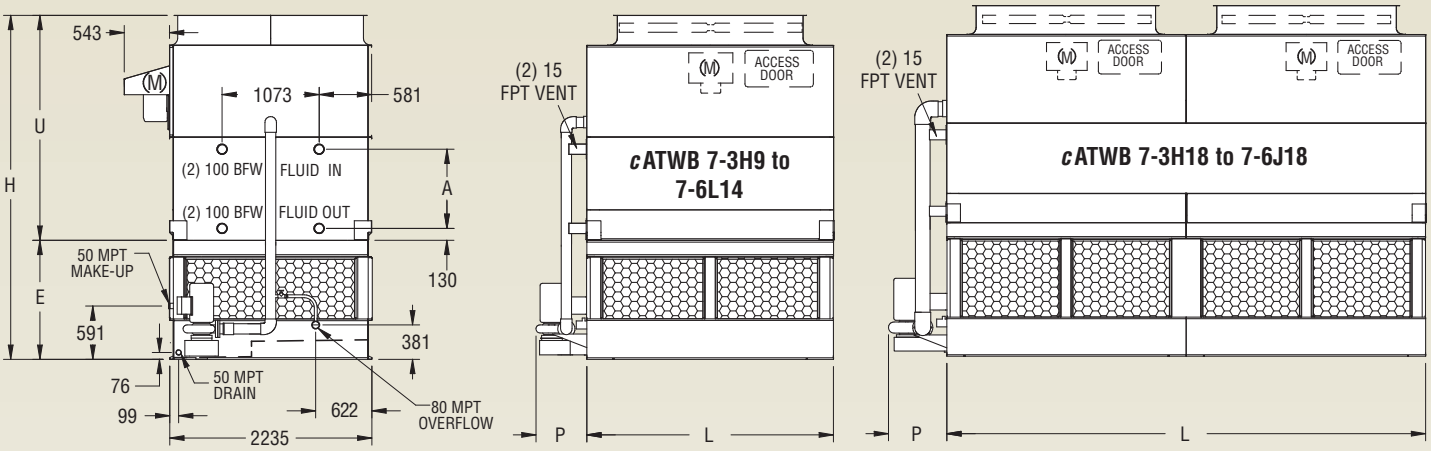


Table 1 Engineering Data

cATWB Model No.*	Fans		Weights (kg)			Coil Volume (Liters)	Spray Pump		Remote Sump			Dimensions (mm)					
	KW	m³/s	Shipping	Operating	Heaviest Section†		KW	L/s	Liters Req'd**	Conn. Size (mm)	Operating Weight (kg)	Height H	Upper U	Lower E	Coil A	Length L	Pump P
cATWB 7-3H9	5.5	16.8	3,420	4,560	2,690	544	1.5	25.8	455	200	4,030	3423	2105	1318	495	2727	563
cATWB 7-3I9	7.5	18.5	3,420	4,560	2,690	544	1.5	25.8	455	200	4,030	3423	2105	1318	495	2727	563
cATWB 7-4I9	7.5	17.9	3,890	5,200	3,160	710	1.5	25.8	455	200	4,670	3613	2296	1318	686	2727	563
cATWB 7-4J9	11	20.1	3,950	5,260	3,220	710	1.5	25.8	455	200	4,730	3613	2296	1318	686	2727	563
cATWB 7-5I9	7.5	17.4	4,380	5,860	3,660	876	1.5	25.8	455	200	5,330	3804	2486	1318	876	2727	563
cATWB 7-5J9	11	19.5	4,440	5,910	3,710	876	1.5	25.8	455	200	5,380	3804	2486	1318	876	2727	563
cATWB 7-6J9	11	18.9	4,930	6,570	4,200	1041	1.5	25.8	455	200	6,040	3994	2677	1318	1067	2727	563
cATWB 7-3J12	11	25.5	4,210	5,790	3,330	715	2.2	34.7	585	250	5,060	3423	2105	1318	495	3648	631
cATWB 7-4J12	11	24.8	4,850	6,650	3,970	937	2.2	34.7	585	250	5,920	3613	2296	1318	686	3648	631
cATWB 7-5J12	11	24.0	5,470	7,500	4,590	1160	2.2	34.7	585	250	6,770	3804	2486	1318	876	3648	631
cATWB 7-5K12	15	26.0	5,500	7,530	4,620	1160	2.2	34.7	585	250	6,790	3804	2486	1318	876	3648	631
cATWB 7-6K12	15	25.2	6,150	8,400	5,270	1382	2.2	34.7	585	250	7,670	3994	2677	1318	1067	3648	631
cATWB 7-5J14	11	26.8	6,300	8,630	5,280	1349	2.2	37.8	700	250	7,810	3915	2486	1429	876	4258	617
cATWB 7-5K14	15	29.1	6,320	8,650	5,310	1349	2.2	37.8	700	250	7,830	3915	2486	1429	876	4258	617
cATWB 7-6K14	15	28.2	7,070	9,660	6,060	1610	2.2	37.8	700	250	8,840	4105	2677	1429	1067	4258	617
cATWB 7-6L14	18.5	30.0	7,080	9,670	6,070	1610	2.2	37.8	700	250	8,850	4105	2677	1429	1067	4258	617
cATWB 7-3H18	(2)5.5	33.8	6,340	8,740	4,950	1056	4	50.4	890	300	7,660	3632	2105	1527	495	5483	670
cATWB 7-3I18	(2)7.5	37.1	6,350	8,750	4,960	1056	4	50.4	890	300	7,670	3632	2105	1527	495	5483	670
cATWB 7-4I18	(2)7.5	36.0	7,310	10,040	5,910	1392	4	50.4	890	300	8,960	3823	2296	1527	686	5483	670
cATWB 7-4J18	(2)11	40.3	7,420	10,160	6,030	1392	4	50.4	890	300	9,080	3823	2296	1527	686	5483	670
cATWB 7-5I18	(2)7.5	34.9	8,260	11,340	6,870	1728	4	50.4	890	300	10,260	4013	2486	1527	876	5483	670
cATWB 7-5J18	(2)11	39.1	8,380	11,450	6,990	1728	4	50.4	890	300	10,370	4013	2486	1527	876	5483	670
cATWB 7-6I18	(2)7.5	33.8	9,240	12,650	7,850	2064	4	50.4	890	300	11,570	4204	2677	1527	1067	5483	670
cATWB 7-6J18	(2)11	37.9	9,360	12,760	7,970	2064	4	50.4	890	300	11,680	4204	2677	1527	1067	5483	670

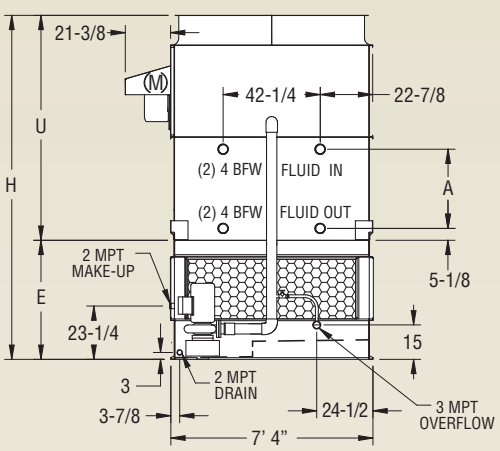
* Tons at standard conditions: 37.7°C inlet 32.2°C outlet and 25.6°C W.B.

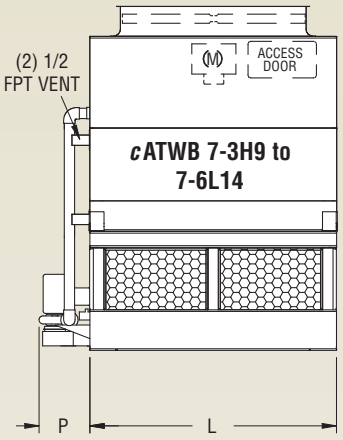
** Liters shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (300mm would normally be sufficient.)

† Heaviest section is the coil section.

Dimensions are subject to change. Do not use for pre-fabrication.

cATWB Engineering Dimensions & Data – English Units





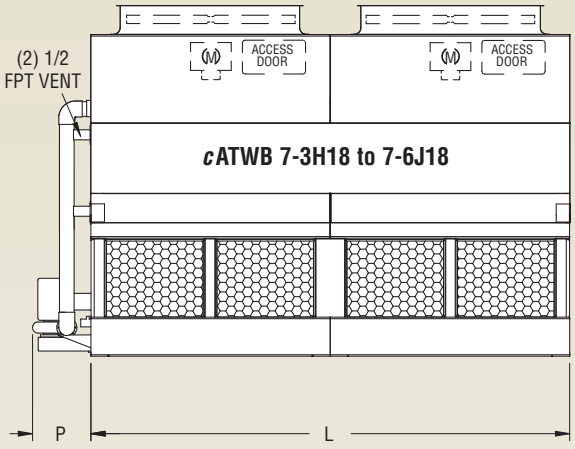


Table 1 Engineering Data

cATWB Model No.*	Fans		Weights (lbs.)			Coil Volume (Gal.)	Spray Pump		Remote Sump			Dimensions (in.)					
	HP	CFM	Shipping	Operating	Heaviest Section†		HP	GPM	Gallons Req'd**	Conn. Size	Operating Weight (lbs.)	Height H	Upper U	Lower E	Coil A	Length L	Pump P
cATWB 7-3H9	7.5	35,830	7,530	10,050	5,930	144	2	410	120	8"	8,880	11' 2-3/4"	6' 10-7/8"	4' 3-7/8"	19-1/2"	8' 11-3/8"	22-1/8"
cATWB 7-3I9	10	39,290	7,540	10,060	5,940	144	2	410	120	8"	8,890	11' 2-3/4"	6' 10-7/8"	4' 3-7/8"	19-1/2"	8' 11-3/8"	22-1/8"
cATWB 7-4I9	10	38,140	8,570	11,460	6,970	188	2	410	120	8"	10,290	11' 10-1/4"	7' 6-3/8"	4' 3-7/8"	27"	8' 11-3/8"	22-1/8"
cATWB 7-4J9	15	42,730	8,700	11,590	7,100	188	2	410	120	8"	10,420	11' 10-1/4"	7' 6-3/8"	4' 3-7/8"	27"	8' 11-3/8"	22-1/8"
cATWB 7-5I9	10	37,000	9,660	12,910	8,060	231	2	410	120	8"	11,740	12' 5-3/4"	8' 1-7/8"	4' 3-7/8"	34-1/2"	8' 11-3/8"	22-1/8"
cATWB 7-5J9	15	41,450	9,790	13,040	8,190	231	2	410	120	8"	11,870	12' 5-3/4"	8' 1-7/8"	4' 3-7/8"	34-1/2"	8' 11-3/8"	22-1/8"
cATWB 7-6J9	15	40,170	10,860	14,480	9,260	275	2	410	120	8"	13,310	13' 1-1/4"	8' 9-3/8"	4' 3-7/8"	42"	8' 11-3/8"	22-1/8"
cATWB 7-3J12	15	54,270	9,280	12,770	7,350	189	3	550	155	10"	11,160	11' 2-3/4"	6' 10-7/8"	4' 3-7/8"	19-1/2"	11' 11-5/8"	24-7/8"
cATWB 7-4J12	15	52,690	10,690	14,670	8,760	248	3	550	155	10"	13,060	11' 10-1/4"	7' 6-3/8"	4' 3-7/8"	27"	11' 11-5/8"	24-7/8"
cATWB 7-5J12	15	51,110	12,060	16,530	10,130	306	3	550	155	10"	14,920	12' 5-3/4"	8' 1-7/8"	4' 3-7/8"	34-1/2"	11' 11-5/8"	24-7/8"
cATWB 7-5K12	20	55,390	12,120	16,590	10,190	306	3	550	155	10"	14,980	12' 5-3/4"	8' 1-7/8"	4' 3-7/8"	34-1/2"	11' 11-5/8"	24-7/8"
cATWB 7-6K12	20	53,680	13,550	18,510	11,620	365	3	550	155	10"	16,900	13' 1-1/4"	8' 9-3/8"	4' 3-7/8"	42"	11' 11-5/8"	24-7/8"
cATWB 7-5J14	15	57,120	13,880	19,020	11,650	356	3	600	185	10"	17,210	12' 10-1/8"	8' 1-7/8"	4' 8-1/4"	34-1/2"	13' 11-5/8"	24-1/4"
cATWB 7-5K14	20	61,910	13,940	19,080	11,710	356	3	600	185	10"	17,270	12' 10-1/8"	8' 1-7/8"	4' 8-1/4"	34-1/2"	13' 11-5/8"	24-1/4"
cATWB 7-6K14	20	60,000	15,580	21,290	13,350	425	3	600	185	10"	19,480	13' 5-5/8"	8' 9-3/8"	4' 8-1/4"	42"	13' 11-5/8"	24-1/4"
cATWB 7-6L14	25	63,860	15,610	21,320	13,380	425	3	600	185	10"	19,510	13' 5-5/8"	8' 9-3/8"	4' 8-1/4"	42"	13' 11-5/8"	24-1/4"
cATWB 7-3H18	(2)7.5	71,910	13,980	19,270	10,910	279	5	800	235	12"	16,890	11' 11"	6' 10-7/8"	5' 1/8"	19-1/2"	17' 11-7/8"	26-3/8"
cATWB 7-3I18	(2)10	78,880	14,010	19,300	10,940	279	5	800	235	12"	16,920	11' 11"	6' 10-7/8"	5' 1/8"	19-1/2"	17' 11-7/8"	26-3/8"
cATWB 7-4I18	(2)10	76,580	16,110	22,140	13,040	368	5	800	235	12"	19,760	12' 6-1/2"	7' 6-3/8"	5' 1/8"	27"	17' 11-7/8"	26-3/8"
cATWB 7-4J18	(2)15	85,790	16,360	22,390	13,290	368	5	800	235	12"	20,010	12' 6-1/2"	7' 6-3/8"	5' 1/8"	27"	17' 11-7/8"	26-3/8"
cATWB 7-5I18	(2)10	74,280	18,220	24,990	15,150	456	5	800	235	12"	22,610	13' 2"	8' 1-7/8"	5' 1/8"	34-1/2"	17' 11-7/8"	26-3/8"
cATWB 7-5J18	(2)15	83,210	18,470	25,240	15,400	456	5	800	235	12"	22,860	13' 2"	8' 1-7/8"	5' 1/8"	34-1/2"	17' 11-7/8"	26-3/8"
cATWB 7-6I18	(2)10	71,980	20,380	27,890	17,310	545	5	800	235	12"	25,510	13' 9-1/2"	8' 9-3/8"	5' 1/8"	42"	17' 11-7/8"	26-3/8"
cATWB 7-6J18	(2)15	80,640	20,630	28,140	17,560	545	5	800	235	12"	25,760	13' 9-1/2"	8' 9-3/8"	5' 1/8"	42"	17' 11-7/8"	26-3/8"

* Tons at standard conditions: 100°F inlet, 90°F outlet and 78°F W.B.

** Gallons shown is water in suspension in unit and piping. Allow for additional water in bottom of remote sump to cover pump suction and strainer during operation. (12" would normally be sufficient.)

† Heaviest section is the coil section.

Dimensions are subject to change. Do not use for pre-fabrication.

cATWB Closed Circuit Cooler Specification

Furnish and install as shown on the plans an EVAPCO Model _____ induced draft counterflow closed circuit cooler. Each unit shall have the capacity to cool _____ lps (gpm) of _____ from _____ °C (°F) to _____ °C (°F) with a _____ °C (°F) entering wet bulb temperature.

Basin and Casing
The basin and casing shall be constructed of heavy gauge mill hot-dip galvanized steel (G-235 in U.S.A., Z-725 in Europe and Z-600 in Asia) 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.

Fan Motor
_____ kW (horsepower) totally enclosed fan cooled motors with 1.15 service factor 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 sheaves designed for 150% of the motor nameplate kW (horsepower). The belt material shall be neoprene reinforced with polyester cord and specifically designed for evaporative cooler 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.

Axial Propeller Fans
Fans shall be heavy-duty axial propeller type statically balanced. The fans shall be constructed of aluminum alloy 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. Materials shall be stainless steel balls with chrome steel races and zinc plated housing for corrosion resistance. 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 (horsepower) totally enclosed motor(s) shall be furnished suitable for outdoor service on _____ volts, _____ hertz, and _____ phase.

Heat Transfer Coil
Cooling coil(s) shall be all prime surface steel, encased in a steel framework and hot-dip galvanized after fabrication as a complete assembly. The tubes shall be arranged in a self-spacing, staggered pattern in the direction of airflow for maximum heat transfer efficiency and minimum pressure drop, without the use of additional spacers between the coil tubes. The coil(s) shall be pneumatically tested under water at 35 bar (400 psig in accordance with "Pressure Equipment Directive" (PED) 97/23/EC in Europe).

Water Distribution System
The spray header shall be constructed of schedule 40 polyvinyl chloride pipe for corrosion resistance. All spray branches shall be removable for cleaning. The water shall be distributed over the entire coil surface by heavy-duty, fiber-reinforced spray nozzles [33.3mm (1-5/16") diameter opening and 38.1mm (1-1/2") splash plate clearance] with 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.

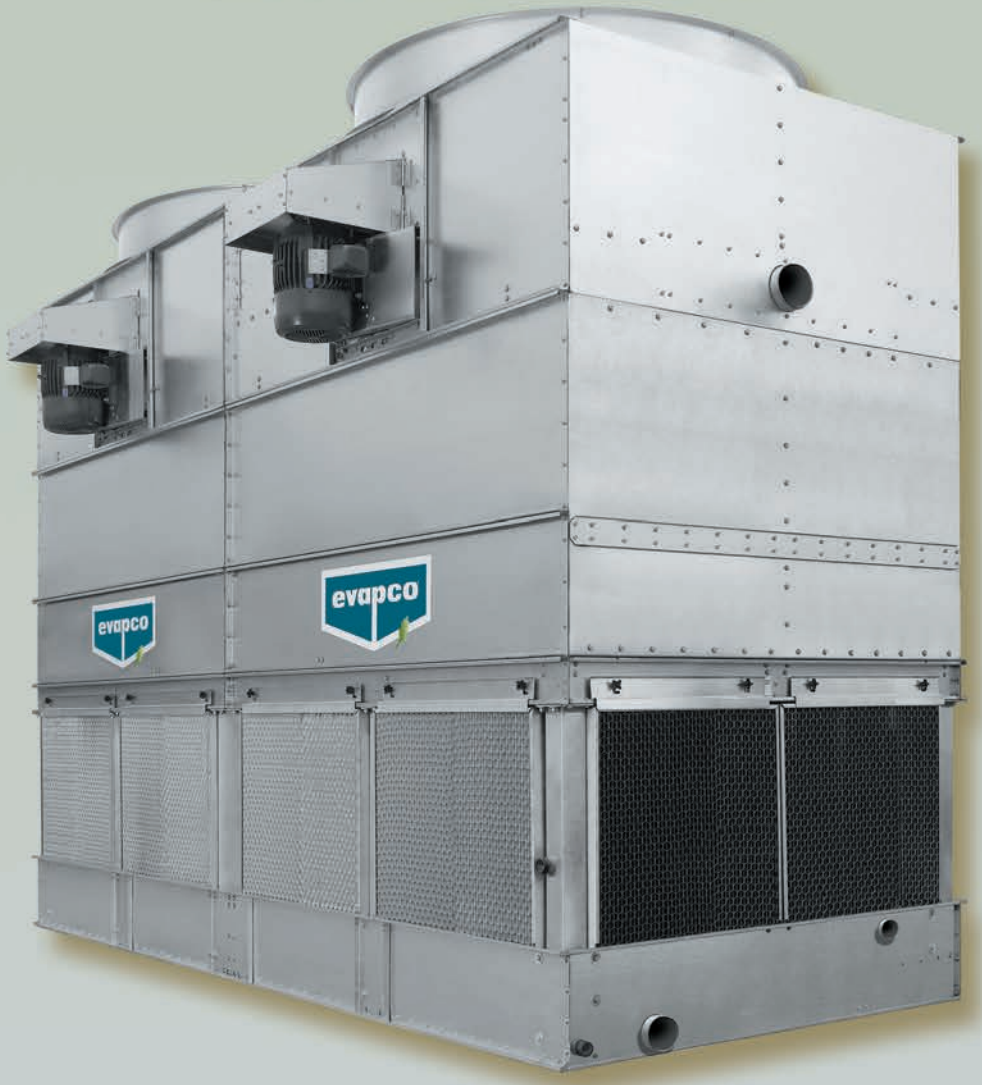
Louvers
The louvers shall be constructed from polyvinyl chloride (PVC). The louvers shall be mounted in easily removable frames for access to the pan for maintenance. The louvers shall have a minimum of two changes in air direction to prevent splash out and block direct sunlight.

Finish
All basin and casing materials shall be constructed of heavy gauge mill hot-dip galvanized steel (G-235 in U.S.A., Z-725 in Europe and Z-600 in Asia). During fabrication, all panel edges shall be coated with a 95% pure zinc-rich compound for superior protection against corrosion.

evapco®

CAT

COOLING TOWERS



CONTAINERIZED ADVANCED TECHNOLOGY

*Up to 234 Tons in a 20' Shipping Container!**

*Up to 472 Tons in a 40' Shipping Container!**

Technology for the Future...Available Today!

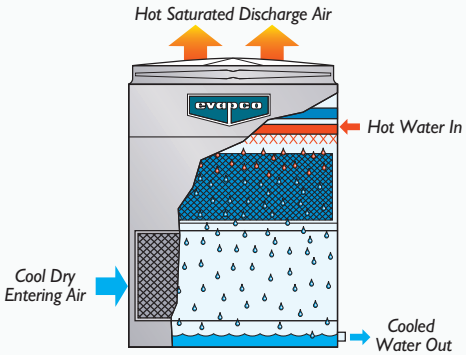
* Tons at nominal conditions: 35°C (95°F) inlet, 29.4°C (85°F) outlet and 25.5°C (78°F) WB

cAT Design and Construction Features

The cAT line of cooling towers reflects EVAPCO's continuing commitment to research and development. Their advanced design provides owners with many operational and performance advantages.

Principle of Operation

Warm water from the heat source is pumped to the water distribution system at the top of the tower. The water is distributed over the wet deck fill by means of large orifice nozzles. Simultaneously, air is drawn in through the air inlet louvers at the base of the tower and travels upward through the wet deck fill opposite the water flow. A small portion of the water is evaporated which removes the heat from the remaining water. The warm moist air is drawn to the top of the cooling tower by the fan and discharged to the atmosphere. The cooled water drains to the basin at the bottom of the tower and is returned to the heat source.



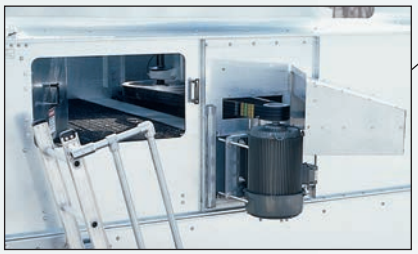
Principle of Operation

For particularly corrosive environments EVAPCO cAT cooling towers are available with type 304 or 316 stainless steel construction. Consult the factory for details on available options.

Fan Drive System

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 totally enclosed fan cooled (T.E.F.C.) fan motor is mounted on the outside for easy access. 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.



External Motor Mount (Optional Ladder Shown)

Power-Band Drive Belt

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

Fan Shaft Bearings

The fan shaft bearings in cAT units are specially selected for long, trouble-free life. They are rated for an L-10 life of 75,000 to 135,000 hours and are the heaviest pillow block bearings available.

Aluminum Alloy Pulleys

Fan pulleys located in the air stream are constructed of corrosion free aluminum for long life. The aluminum also helps belts last longer.

WST Air Inlet Louvers

Water and Sight Tight air inlet louvers are designed to effectively eliminate splash-out and sunlight, greatly reducing the potential for algae formation inside the cooling tower. They are manufactured of corrosion-free PVC and mounted in light-weight frames to allow for easy removal and convenient access to the basin section.

Type 304 Stainless Steel Strainers

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

Totally Enclosed Motors

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

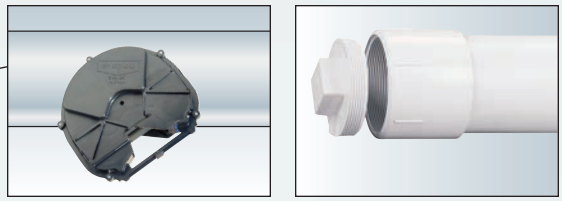
U.S. Patent No. 6315804

PVC Drift Eliminators

The final elements in the upper part of the cooling tower are drift eliminators. They strip the entrained water droplets from the leaving air stream.
EVAPCO eliminators are constructed entirely of inert, corrosion-free PVC. This patented PVC material has been specially treated to resist damaging ultraviolet light. The eliminators are assembled in easily handled sections to facilitate removal, thereby exposing the upper portion of the unit and water distribution system for periodic inspection.

Water Saver Drift Eliminators

- Patented design reduces drift rate to 0.001%.
- Made from corrosion resistant PVC for long life.



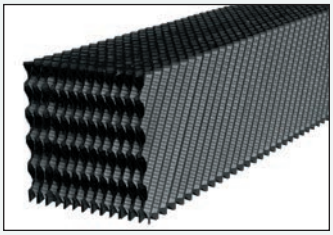
EvapJet™ Nozzle

Water Distribution System

- Non-corrosive PVC construction with new EvapJet™ nozzles.
- Large orifice nozzles prevent clogging and are threaded for easy removal and positive positioning.
- System branches have threaded end caps to assist with debris removal.

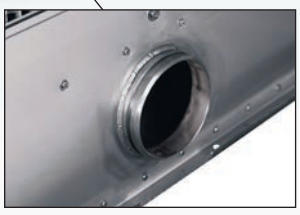
Patented** EVAPAK® Fill

The patented EVAPAK® fill design used in the *c*AT Cooling Tower is specially designed to induce highly turbulent mixing of the air and water for superior heat transfer. Special drainage tips allow high water loadings without excessive pressure drop. The fill is constructed of inert polyvinyl chloride, (PVC), will not rot or decay, and is formulated to withstand water temperatures of 55˚C (130˚F). Because of the unique way in which the crossfluted sheets are bonded together, and the bottom support of the fill section, the structural integrity of the fill is greatly enhanced, making the fill usable as a working platform.



The fill selected for the *c*AT Cooling Tower has excellent fire resistant qualities. *c*AT Cooling Tower fill has a flame spread rating of 5 per ASTM-E84-81a.

A higher temperature fill is available for water temperatures exceeding 55˚C (130˚F). Consult your EVAPCO representative for further details.



Quick Connect Piping System

- All inlet and outlet piping connections are beveled for welding and grooved to accept a mechanical coupling device as standard.
- Facilitates easy pipe connections for quick installation.
- Flanged connections are available as an option.

cAT Thermal Performance – S.I. Data

Model No.	Motor kW	TOWER CAPABILITY IN L/s AT THE FOLLOWING TEMPERATURE CONDITIONS (°C)										
		EWT	32°	36°	32°	36°	32°	36°	32°	37°	35°	40°
		LWT	27°	26°	27°	26°	27°	26°	27°	27°	30°	30°
		WB	19°	19°	20°	20°	21°	21°	22°	22°	24°	24°
cAT 17-49	7.5		47	28	44	26	40	23	36	24	45	31
cAT 17-59	11		49	29	45	26	41	23	37	25	47	32
cAT 17-69	11		53	33	49	30	45	27	41	29	51	36
cAT 17-79	11		55	35	51	32	47	30	42	31	53	38
cAT 17-89	15		58	36	54	33	50	30	45	32	56	40
cAT 17-99	15		60	38	56	35	51	32	46	34	58	41
cAT 17-511	7.5		52	31	49	29	44	26	40	27	50	35
cAT 17-611	15		59	35	55	32	50	29	45	30	57	39
cAT 17-711	11		61	39	57	36	52	33	47	34	59	42
cAT 17-811	15		65	40	60	37	55	34	50	35	62	44
cAT 17-911	15		67	42	62	39	57	36	52	38	64	46
cAT 17-312	7.5		57	34	54	31	49	28	43	29	56	38
cAT 17-412	7.5		60	37	56	35	51	32	46	33	58	41
cAT 17-512	15		66	38	61	35	55	31	49	33	63	43
cAT 17-612	15		71	44	66	40	61	37	55	38	69	48
cAT 17-712	15		73	46	69	43	63	40	57	41	71	50
cAT 17-812	18.5		76	47	71	44	65	40	59	42	74	52
cAT 17-912	18.5		78	50	73	46	67	42	61	44	76	54

Model No.	Motor kW	TOWER CAPABILITY IN L/s AT THE FOLLOWING TEMPERATURE CONDITIONS (°C)									
		EWT	35°	40°	35°	37°	40°	42°	36°	37°	41°	42°
		LWT	30°	30°	30°	32°	30°	32°	31°	32°	31°	32°
		WB	25°	25°	26°	26°	26°	26°	27°	27°	27°	27°
cAT 17-49	7.5		41	29	36	49	25	34	38	45	27	32
cAT 17-59	11		43	29	37	51	26	35	39	47	27	32
cAT 17-69	11		47	33	41	56	30	39	43	51	31	36
cAT 17-79	11		48	35	43	58	32	41	45	53	33	38
cAT 17-89	15		51	37	45	61	33	43	47	56	34	40
cAT 17-99	15		53	38	47	---	35	45	49	57	36	42
cAT 17-511	7.5		46	32	40	55	28	38	42	50	29	35
cAT 17-611	15		52	36	46	63	31	43	48	57	33	40
cAT 17-711	11		54	39	48	64	35	46	50	59	37	43
cAT 17-811	15		57	40	51	68	36	48	53	62	38	45
cAT 17-911	15		59	43	52	70	39	50	54	64	40	46
cAT 17-312	7.5		50	34	44	61	30	42	46	55	32	38
cAT 17-412	7.5		53	38	47	63	34	45	49	58	36	42
cAT 17-512	15		57	39	50	69	34	47	52	63	36	43
cAT 17-612	15		63	44	55	75	40	53	58	68	42	49
cAT 17-712	15		65	47	58	77	43	55	60	71	44	51
cAT 17-812	18.5		67	48	60	80	43	57	62	73	45	53
cAT 17-912	18.5		69	50	62	82	45	59	64	75	47	55

To Make a Selection:
Locate the column with the desired operating temperature conditions. Read down the column until you find the L/s equal to or greater than the flow required. Read horizontally to the left to find the model number of the unit that will perform the duty. For selections and conditions other than those stated, consult your *i*ES Selection Program or local EVAPCO representative.

cAT Thermal Performance – English Data

Model No.	Motor Hp	TOWER CAPABILITY IN USGPM AT THE FOLLOWING TEMPERATURE CONDITIONS (°F)										
		EWT	90°	95°	90°	95°	90°	95°	90°	95°	95°	100°
		LWT	80°	80°	80°	80°	80°	80°	80°	80°	85°	85°
		WB	66°	66°	68°	68°	70°	70°	72°	72°	75°	75°
cAT 17-49	10		673	534	625	493	557	442	487	391	632	504
cAT 17-59	15		700	547	647	502	573	447	496	393	655	514
cAT 17-69	15		763	612	711	567	637	511	561	456	718	578
cAT 17-79	15		790	638	737	595	663	542	589	491	744	606
cAT 17-89	20		837	674	780	627	701	567	620	508	788	639
cAT 17-99	20		861	696	803	649	723	592	643	536	811	661
cAT 17-511	10		750	592	695	546	619	488	539	431	703	558
cAT 17-611	20		854	669	791	615	701	549	608	483	800	629
cAT 17-711	15		883	713	823	665	741	605	658	546	832	677
cAT 17-811	20		932	748	868	695	779	628	687	561	877	709
cAT 17-911	20		962	777	897	725	808	661	718	598	906	738
cAT 17-312	10		825	649	764	597	678	532	590	468	772	610
cAT 17-412	10		865	696	805	648	724	587	641	527	814	660
cAT 17-512	20		939	733	868	673	768	599	665	526	878	688
cAT 17-612	20		1023	820	953	760	854	685	751	611	963	775
cAT 17-712	20		1060	856	988	798	890	727	790	658	998	813
cAT 17-812	25		1099	884	1024	822	920	743	813	665	1035	838
cAT 17-912	25		1132	915	1056	854	951	778	845	705	1067	869

Model No.	Motor Hp	TOWER CAPABILITY IN USGPM AT THE FOLLOWING TEMPERATURE CONDITIONS (°F)										
		EWT	95°	100°	95°	97°	100°	102°	95°	97°	100°	102°
		LWT	85°	85°	85°	87°	85°	87°	85°	87°	85°	87°
		WB	76°	76°	78°	78°	78°	78°	80°	80°	80°	80°
cAT 17-49	10		597	477	521	630	419	506	427	546	348	441
cAT 17-59	15		617	485	532	653	423	516	431	560	347	446
cAT 17-69	15		681	550	597	717	487	581	495	625	408	511
cAT 17-79	15		707	579	625	743	519	609	527	651	446	542
cAT 17-89	20		748	609	659	786	541	642	550	688	458	567
cAT 17-99	20		770	632	681	809	567	664	575	710	490	591
cAT 17-511	10		664	528	578	702	462	561	470	606	382	487
cAT 17-611	20		754	595	652	798	519	633	529	686	429	548
cAT 17-711	15		789	646	697	830	579	680	588	728	497	605
cAT 17-811	20		832	674	731	875	597	712	607	764	504	627
cAT 17-911	20		860	705	760	904	632	742	642	793	545	660
cAT 17-312	10		729	578	632	770	503	613	513	664	416	531
cAT 17-412	10		772	629	681	812	560	663	569	710	478	586
cAT 17-512	20		828	650	714	876	566	692	578	751	465	598
cAT 17-612	20		913	737	800	961	652	779	663	838	547	684
cAT 17-712	20		948	776	838	996	696	817	706	873	598	726
cAT 17-812	25		982	797	864	1032	707	841	719	903	598	742
cAT 17-912	25		1013	831	895	1064	745	873	756	933	643	777

To Make a Selection:
Locate the column with the desired operating temperature conditions. Read down the column until you find the GPM equal to or greater than the flow required. Read horizontally to the left to find the model number of the unit that will perform the duty. For selections and conditions other than those stated, consult your *i*ES Selection Program or local EVAPCO representative.

cAT Engineering Dimensions & Data – S.I. Data

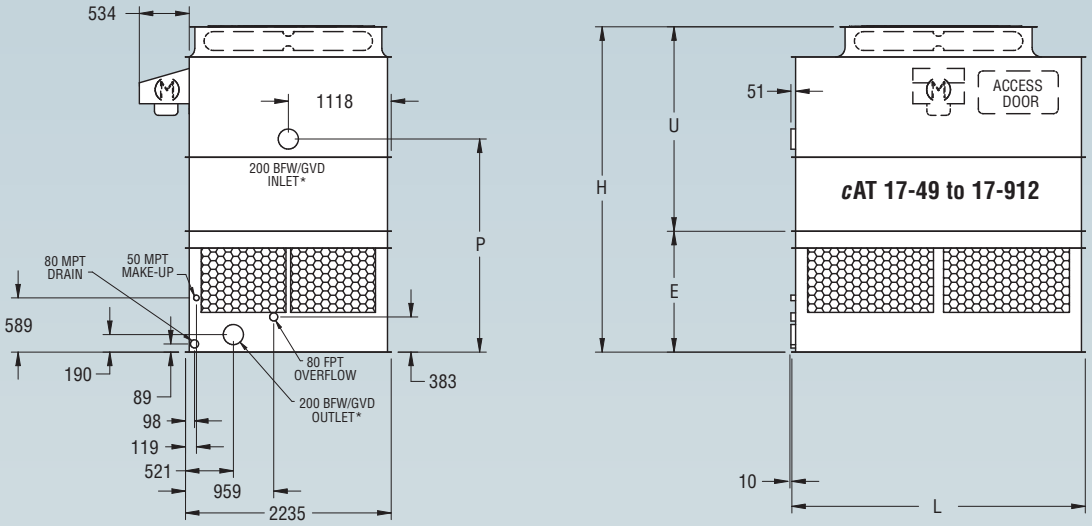


Table 1 Engineering Data

cAT Model No.	Weights (kg)			Fan Motor (kW)	Air Flow (m^3/s)	Dimensions (mm)				
	Shipping	Operating	Heaviest Section (Pan/Fan)			L	H	U	P	E
cAT 17-49	1,970	3,015	1,260	7.5	19	2731	3839	2524	2619	1315
cAT 17-59	1,880	3,050	1,295	11	21	2731	3534	2219	2315	1315
cAT 17-69	2,000	2,930	1,295	11	21	2731	3839	2524	2619	1315
cAT 17-79	2,130	3,180	1,295	11	21	2731	4143	2829	2924	1314
cAT 17-89	2,025	3,070	1,315	15	23	2731	3839	2524	2619	1315
cAT 17-99	2,155	3,200	1,315	15	23	2731	4143	2829	2924	1314
cAT 17-511	2,210	3,410	1,395	7.5	21	3188	3839	2524	2619	1315
cAT 17-611	2,130	3,335	1,450	15	27	3188	3534	2219	2315	1315
cAT 17-711	2,390	3,590	1,430	11	23	3188	4143	2829	2924	1314
cAT 17-811	2,265	3,465	1,450	15	26	3188	3839	2524	2619	1315
cAT 17-911	2,415	3,615	1,450	15	26	3188	4143	2829	2924	1314
cAT 17-312	2,375	3,810	1,490	7.5	23	3651	3839	2524	2619	1315
cAT 17-412	2,530	3,965	1,490	7.5	23	3651	4143	2829	2924	1314
cAT 17-512	2,285	3,720	1,540	15	30	3651	3534	2219	2315	1315
cAT 17-612	2,430	3,865	1,540	15	29	3651	3839	2524	2619	1315
cAT 17-712	2,585	4,020	1,540	15	29	3651	4143	2829	2924	1314
cAT 17-812	2,445	3,880	1,555	18.5	31	3651	3839	2524	2619	1315
cAT 17-912	2,600	4,030	1,555	18.5	31	3651	4143	2829	2924	1314

NOTES: (1) An adequately sized bleed line must be installed in the cooling tower system to prevent build-up of impurities in the recirculated water.
(2) Do not use catalog drawings for certified prints. Dimensions are subject to change.
(3) * Connections larger than 80mm are Beveled for Welding (BFW) and grooved (GVD) for a mechanical coupling.
(4) Adequate spacing must be allowed for access to the cooling tower.

cAT Engineering Dimensions & Data – English Data

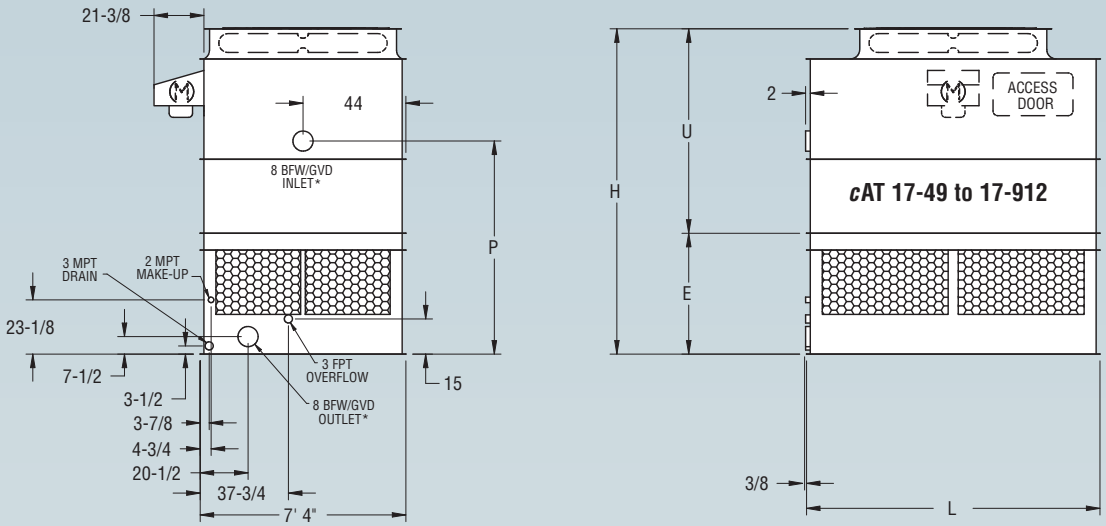


Table 1 Engineering Data

cAT Model No.	Weights (lbs.)			Fan Motor (HP)	Air Flow (CFM)	Dimensions (in.)				
	Shipping	Operating	Heaviest Section (Pan/Fan)			L	H	U	P	E
cAT 17-49	4,340	6,650	2,780	10	39200	107-1/2"	151-1/8"	99-3/8"	103-1/8"	51-3/4"
cAT 17-59	4,150	6,460	2,850	15	45400	107-1/2"	139-1/8"	87-3/8"	91-1/8"	51-3/4"
cAT 17-69	4.410	6,720	2,850	15	44500	107-1/2"	151-1/8"	99-3/8"	103-1/8"	51-3/4"
cAT 17-79	4,700	7,010	2,850	15	43800	107-1/2"	163-1/8"	111-3/8"	115-1/8"	51-3/4"
cAT 17-89	4,460	6,770	2,900	20	48800	107-1/2"	151-1/8"	99-3/8"	103-1/8"	51-3/4"
cAT 17-99	4,750	7,060	2,900	20	47900	107-1/2"	163-1/8"	111-3/8"	115-1/8"	51-3/4"
cAT 17-511	4,870	7,520	3,080	10	44400	125-1/2"	151-1/8"	99-3/8"	103-1/8"	51-3/4"
cAT 17-611	4,700	7,350	3,200	20	56300	125-1/2"	138-11/8"	87-3/8"	91-1/8"	51-3/4"
cAT 17-711	5,270	7,920	3,150	15	49600	125-1/2"	163-1/8"	111-3/8"	115-1/8"	51-3/4"
cAT 17-811	4,990	7,640	3,200	20	55200	125-1/2"	151-1/8"	99-3/8"	103-1/8"	51-3/4"
cAT 17-911	5,320	7,970	3,200	20	54200	125-1/2"	163-1/8"	111-3/8"	115-1/8"	51-3/4"
cAT 17-312	5,240	8,400	3,280	10	49500	143-3/4"	151-1/8"	99-3/8"	103-1/8"	51-3/4"
cAT 17-412	5,580	8,740	3,280	10	48700	143-3/4"	163-1/8"	111-3/8"	115-1/8"	51-3/4"
cAT 17-512	5,040	8,200	3,400	20	62700	143-3/4"	139-1/8"	87-3/8"	91-1/8"	51-3/4"
cAT 17-612	5,360	8,520	3,400	20	61500	143-3/4"	151-1/8"	99-3/8"	103-1/8"	51-3/4"
cAT 17-712	5,700	8,860	3,400	20	60500	143-3/4"	163-1/8"	111-3/8"	115-1/8"	51-3/4"
cAT 17-812	5,390	8,550	3,430	25	66000	143-3/4"	151-1/8"	99-3/8"	103-1/8"	51-3/4"
cAT 17-912	5,730	8,890	3,430	25	64800	143-3/4"	163-1/8"	111-3/8"	115-1/8"	51-3/4"

NOTES: (1) An adequately sized bleed line must be installed in the cooling tower system to prevent build-up of impurities in the recirculated water.
(2) Do not use catalog drawings for certified prints. Dimensions are subject to change.
(3) * Connections larger than 3" are Beveled for Welding (BFW) and grooved (GVD) for a mechanical coupling.
(4) Adequate spacing must be allowed for access to the cooling tower.

cAT Thermal Performance – S.I. Data

Model No.	Motor kW	TOWER CAPABILITY IN L/s AT THE FOLLOWING TEMPERATURE CONDITIONS (°C)										
		EWT	32°	36°	32°	36°	32°	36°	32°	37°	35°	40°
		LWT	27°	26°	27°	26°	27°	26°	27°	27°	30°	30°
		WB	19°	19°	20°	20°	21°	21°	22°	22°	24°	24°
*c*AT 17-214	11		72	44	68	40	62	36	55	38	70	48
*c*AT 17-314	11		75	47	70	44	65	40	58	42	73	52
*c*AT 17-414	18.5		78	46	73	42	66	38	59	40	75	51
*c*AT 17-514	15		79	48	74	45	68	40	61	42	77	53
*c*AT 17-614	15		82	52	77	48	70	44	63	46	79	56
*c*AT 17-714	18.5		85	52	79	48	73	44	65	46	82	58
*c*AT 17-814	22		90	56	84	52	77	47	69	49	87	61
*c*AT 17-914	22		92	58	86	54	79	50	72	52	89	64
*c*AT 27-518	(2)5.5		90	56	84	52	77	48	70	50	87	62
*c*AT 27-618	(2)11		99	58	92	53	83	47	74	50	95	64
*c*AT 27-718	(2)11		107	66	100	61	92	55	82	58	103	72
*c*AT 27-818	(2)15		117	73	109	68	100	61	90	64	113	80
*c*AT 27-918	(2)15		120	76	113	71	103	65	93	68	117	83

Model No.	Motor kW	TOWER CAPABILITY IN L/s AT THE FOLLOWING TEMPERATURE CONDITIONS (°C)										
		EWT	35°	40°	35°	37°	40°	42°	36°	37°	41°	42°
		LWT	30°	30°	30°	32°	30°	32°	31°	32°	31°	32°
		WB	25°	25°	26°	26°	26°	26°	27°	27°	27°	27°
*c*AT 17-214	11		64	44	56	76	39	53	59	70	41	49
*c*AT 17-314	11		67	48	59	79	43	56	62	72	45	52
*c*AT 17-414	18.5		68	46	60	82	41	57	63	75	43	52
*c*AT 17-514	15		70	49	62	83	44	59	64	76	46	54
*c*AT 17-614	15		72	52	64	86	47	61	67	79	49	57
*c*AT 17-714	18.5		75	53	66	89	48	63	69	81	50	58
*c*AT 17-814	22		79	57	70	94	51	67	73	86	53	62
*c*AT 17-914	22		82	59	73	97	54	69	76	89	56	64
*c*AT 27-518	(2)5.5		80	57	71	95	51	67	74	87	54	63
*c*AT 27-618	(2)11		86	58	75	104	52	71	79	95	54	65
*c*AT 27-718	(2)11		94	67	83	112	60	79	87	103	63	73
*c*AT 27-818	(2)15		103	74	92	123	66	88	96	112	70	81
*c*AT 27-918	(2)15		106	77	95	---	70	90	99	116	73	84

To Make a Selection:
Locate the column with the desired operating temperature conditions. Read down the column until you find the L/s equal to or greater than the flow required. Read horizontally to the left to find the model number of the unit that will perform the duty. For selections and conditions other than those stated, consult your *i*ES Selection Program or local EVAPCO representative.

cAT Thermal Performance – English Data

Model No.	Motor Hp	TOWER CAPABILITY IN USGPM AT THE FOLLOWING TEMPERATURE CONDITIONS (°F)										
		EWT	90°	95°	90°	95°	90°	95°	90°	95°	95°	100°
		LWT	80°	80°	80°	80°	80°	80°	80°	80°	85°	85°
		WB	66°	66°	68°	68°	70°	70°	72°	72°	75°	75°
cAT 17-214	15		1043	825	968	763	863	683	753	603	979	779
cAT 17-314	15		1087	877	1013	817	912	742	808	668	1024	832
cAT 17-414	25		1121	877	1037	805	918	718	795	631	1049	824
cAT 17-514	20		1140	910	1061	842	949	758	833	675	1072	860
cAT 17-614	20		1183	955	1103	890	993	811	881	732	1114	907
cAT 17-714	25		1222	981	1139	910	1021	821	899	733	1151	928
cAT 17-814	30		1295	1043	1207	969	1085	877	959	785	1220	988
cAT 17-914	30		1334	1078	1244	1006	1121	917	996	831	1257	1025
cAT 27-518	(2)7.5		1303	1049	1214	976	1091	884	965	794	1227	995
cAT 27-618	(2)15		1415	1104	1308	1014	1157	903	1002	792	1324	1037
cAT 27-718	(2)15		1542	1235	1436	1145	1287	1032	1132	920	1451	1168
cAT 27-818	(2)20		1690	1361	1575	1265	1416	1145	1252	1026	1592	1290
cAT 27-918	(2)20		1740	1406	1622	1312	1461	1196	1298	1083	1639	1336

Model No.	Motor Hp	TOWER CAPABILITY IN USGPM AT THE FOLLOWING TEMPERATURE CONDITIONS (°F)										
		EWT	95°	100°	95°	97°	100°	102°	95°	97°	100°	102°
		LWT	85°	85°	85°	87°	85°	87°	85°	87°	85°	87°
		WB	76°	76°	78°	78°	78°	78°	80°	80°	80°	80°
cAT 17-214	15		925	738	805	976	647	783	659	845	536	682
cAT 17-314	15		972	794	857	1022	708	836	720	895	606	741
cAT 17-414	25		989	779	854	1047	679	828	692	898	558	716
cAT 17-514	20		1015	816	888	1070	720	864	733	930	602	757
cAT 17-614	20		1058	866	934	1112	776	911	787	975	665	810
cAT 17-714	25		1091	883	958	1148	782	932	795	1002	658	820
cAT 17-814	30		1158	941	1019	1217	835	993	849	1065	707	876
cAT 17-914	30		1193	979	1055	1254	878	1029	891	1100	758	916
cAT 27-518	(2)7.5		1163	947	1026	1224	843	1000	857	1070	719	883
cAT 27-618	(2)15		1247	980	1075	1320	853	1042	870	1132	700	901
cAT 27-718	(2)15		1375	1111	1206	1448	982	1173	999	1262	824	1031
cAT 27-818	(2)20		1511	1229	1330	1588	1091	1296	1109	1390	924	1143
cAT 27-918	(2)20		1556	1276	1376	1635	1145	1342	1162	1434	989	1195

To Make a Selection:
Locate the column with the desired operating temperature conditions. Read down the column until you find the GPM equal to or greater than the flow required. Read horizontally to the left to find the model number of the unit that will perform the duty. For selections and conditions other than those stated, consult your *i*ES Selection Program or local EVAPCO representative.

cAT Engineering Dimensions & Data – S.I. Data

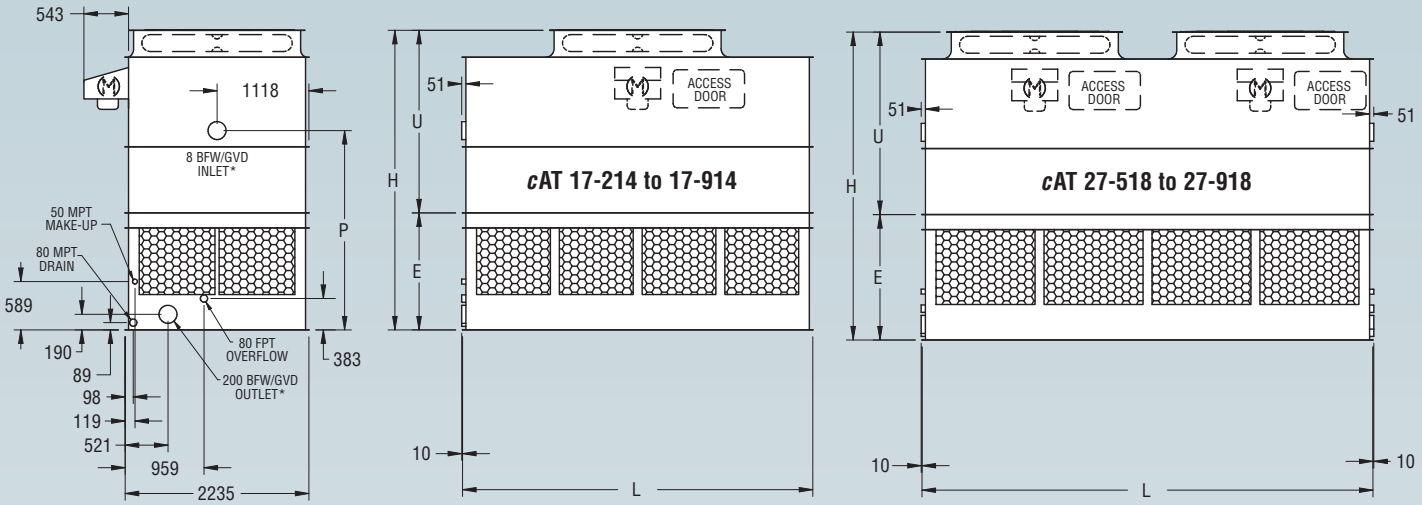


Table 2 Engineering Data

cAT Model No.	Weights (kg)			Fan Motor (kW)	Air Flow (m^3/s)	Dimensions (mm)				
	Shipping	Operating	Heaviest Section (Pan/Fan)			L	H	U	P	E
cAT 17-214	2,730	4,370	1,710	11	29	4261	3950	2524	2731	1426
cAT 17-314	2,925	4,565	1,710	11	28	4261	4255	2829	3035	1426
cAT 17-414	2,600	4,235	1,745	18.5	35	4261	3645	2219	2426	1426
cAT 17-514	2,755	4,390	1,735	15	32	4261	3950	2524	2731	1426
cAT 17-614	2,950	4,585	1,735	15	31	4261	4255	2729	3035	1426
cAT 17-714	2,765	4,405	1,745	18.5	34	4261	3950	2524	2731	1426
cAT 17-814	2,775	4,415	1,755	22	36	4261	3950	2524	2731	1426
cAT 17-914	2,970	4,610	1,755	22	35	4261	4255	2829	3035	1426
cAT 27-518	3,915	6,110	2,405	(2) 5.5	34	5486	4356	2829	3137	1527
cAT 27-618	3,515	5,710	2,450	(2) 11	43	5486	3747	2219	2527	1527
cAT 27-718	3,740	5,935	2,450	(2) 11	42	5486	4051	2524	2832	1527
cAT 27-818	3,760	5,955	2,470	(2) 15	47	5486	4051	2524	2832	1527
cAT 27-918	3,985	6,180	2,470	(2) 15	46	5486	4356	2829	3137	1527

NOTES: (1) An adequately sized bleed line must be installed in the cooling tower system to prevent build-up of impurities in the recirculated water.
(2) Do not use catalog drawings for certified prints. Dimensions are subject to change.
(3) * Connections larger than 80mm are Beveled for Welding (BFW) and grooved for a mechanical coupling.
(4) Adequate spacing must be allowed for access to the cooling tower.

cAT Engineering Dimensions & Data – English Data

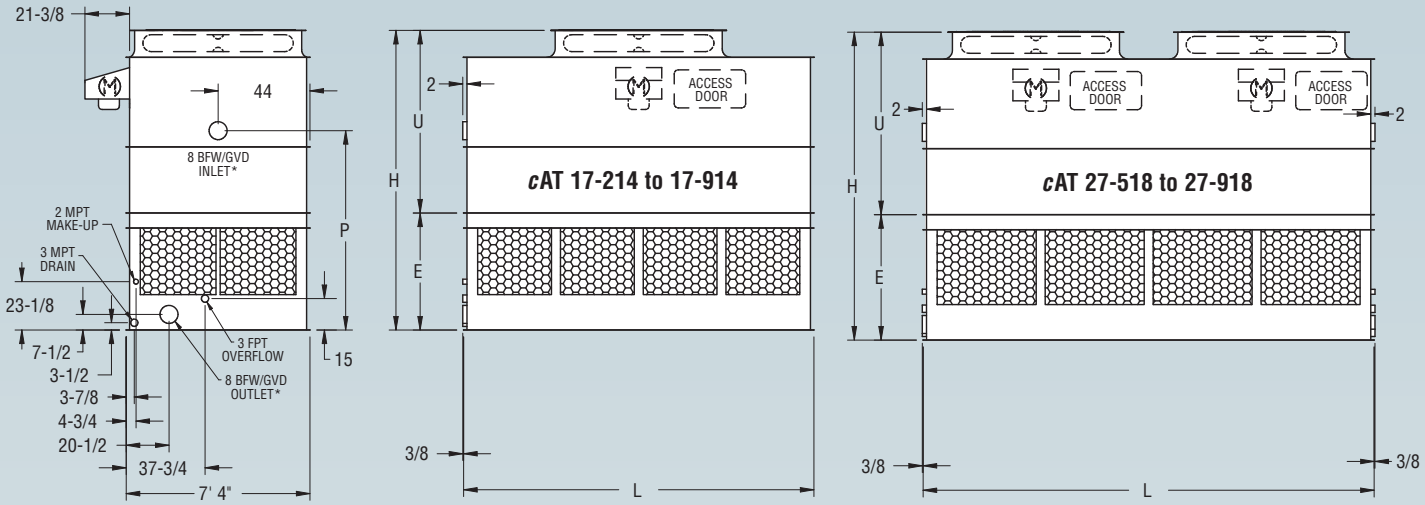


Table 2 Engineering Data

cAT Model No.	Weights (lbs.)			Fan Motor (HP)	Air Flow (CFM)	Dimensions (in.)				
	Shipping	Operating	Heaviest Section (Pan/Fan)			L	H	U	P	E
cAT 17-214	6,020	9,630	3,770	15	61300	167-3/4"	155-1/2"	99-3/8"	107-1/2"	56-1/8"
cAT 17-314	6,450	10,060	3,770	15	60300	167-3/4"	167-1/2"	111-3/8"	119-1/2"	56-1/8"
cAT 17-414	5,730	9,340	3,850	25	73400	167-3/4"	143-1/2"	87-3/8"	95-1/2"	56-1/8"
cAT 17-514	6,070	9,680	3,820	20	67100	167-3/4"	155-1/2"	99-3/8"	107-1/2"	56-1/8"
cAT 17-614	6,500	10,110	3,820	20	66000	167-3/4"	167-1/2"	111-3/8"	119-1/2"	56-1/8"
cAT 17-714	6,100	9,710	3,850	25	72000	167-3/4"	155-1/2"	99-3/8"	107-1/2"	56-1/8"
cAT 17-814	6,120	9,730	3,870	30	76300	167-3/4"	155-1/2"	99-3/8"	107-1/2"	56-1/8"
cAT 17-914	6,550	10,160	3,870	30	74900	167-3/4"	167-1/2"	111-3/8"	119-1/2"	56-1/8"
cAT 27-518	8,630	13,470	5,300	(2) 7.5	71100	216"	171-1/2"	111-3/8"	123-1/2"	60-1/8"
cAT 27-618	7,750	12,590	5,400	(2) 15	91700	216"	147-1/2"	87-3/8"	99-1/2"	60-1/8"
cAT 27-718	8,240	13,080	5,400	(2) 15	89900	216"	159-1/2"	99-3/8"	111-1/2"	60-1/8"
cAT 27-818	8,290	13,130	5,450	(2) 20	98600	216"	159-1/2"	99-3/8"	111-1/2"	60-1/8"
cAT 27-918	8,780	13,620	5,450	(2) 20	96700	216"	171-1/2"	111-3/8"	123-1/2"	60-1/8"

NOTES: (1) An adequately sized bleed line must be installed in the cooling tower system to prevent build-up of impurities in the recirculated water.
(2) Do not use catalog drawings for certified prints. Dimensions are subject to change.
(3) * Connections larger than 3" are Beveled for Welding (BFW) and grooved for a mechanical coupling.
(4) Adequate spacing must be allowed for access to the cooling tower.

Design

EVAPCO units are of heavy-duty construction and designed for long trouble-free operation. Proper equipment selection, installation and maintenance is, however, necessary to ensure full unit performance.

Some of the major considerations in the application of a tower is presented below. For additional information, contact the factory.

Air Circulation

It is important that proper air circulation be provided. The best location is on an unobstructed roof top or on ground level away from walls and other barriers. Those cooling towers located in wells, enclosures or adjacent to high walls must be properly located to avoid the problems associated with recirculation.

Recirculation raises the wet bulb temperature of the entering air causing the water temperature to rise above the design. For these cases, the discharge of the fan should be located at a height even with the adjacent wall, thereby reducing the chance of recirculation. For additional information, see the EVAPCO Equipment Layout Manual.

Piping

Tower piping should be designed and installed in accordance with generally accepted engineering practices. The piping layout should be symmetrical on multiple unit systems, and sized for a reasonably low water velocity and pressure drop.

Each cell of the *c*AT Cooling Tower is furnished with one inlet and one outlet piping connection. This design reduces the amount of external piping and thereby lowers the installed cost of the cooling tower. The water distribution system is pressurized and self-balancing. Since field balancing is not required on the *c*AT, the need for flow balancing valves is eliminated, further reducing the cost of tower installation. The wide orifice nozzles with anti-sludge ring used in the *c*AT water distribution system helps prevent clogging, reducing the maintenance costs of the water distribution system.

All piping should be securely anchored by properly designed hangers and supports.

Recirculating Water System

The surest way to protect the recirculating water system from freezing is with a remote sump. The remote sump should be located inside the building and below the unit. All water in the cooling tower basin should drain to the remote sump when the system pump cycles off.

Other freeze protection methods are available when a remote sump is not feasible. Electric pan heaters, steam or hot water coils can be used to keep the pan water from freezing when the unit cycles off. Water lines to and from the unit, and related piping should be heat traced and insulated up to the overflow level in order to protect from freezing.

Water Treatment

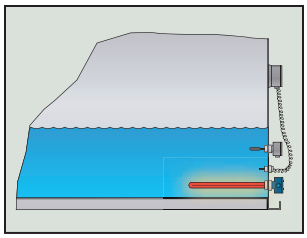
In some cases, the make-up water will have high impurity levels and a normal bleed will not be enough to prevent scale formation. In these cases, the services of an experienced water treatment company should be retained.

The water treatment program prescribed for the given conditions must be compatible with the unit's materials of construction. If an acid is used to control pH, it should be accurately metered in dilute solution such that the spray water is held between a pH of 7.0 and 8.8. Batch feeding of chemicals is not recommended.

Units constructed of galvanized steel operating with circulating water having a pH of 8.3 or higher may require periodic passivation to prevent the formation of white rust. White rust is a corrosion byproduct of the protective zinc barrier and appears on the metal surface as white, waxy formations. If white rust forms and is left untreated, it may flake off and leave the bare metal substrate exposed.

Electric Heaters

Electric immersion heaters for the tower basin are available. They are sized to maintain a +4°C to +5°C (+40°F) pan water temperature with the fans off and an ambient air temperature of -18°C (0°F). They are furnished with a thermostat and low water protection device to cycle the heater on when required and to prevent the heater elements from energizing unless they are completely submerged. All components are in weatherproof enclosures for outdoor use. The heater power contactors and electric wiring are not included as standard.



Heater Sizes

Models	-18°C / 0°F kW	-29°C / -20°F kW	-40°C / -40°F kW
*c*AT 17-49 to 17-99	7	10	15
*c*AT 17-511 to 17-911	8	12	15
*c*AT 17-312 to 17-912	8	14	18
*c*AT 17-214 to 17-914	10	14	20
*c*AT 27-518 to 27-918	12	18	24

Control of Biological Contaminants

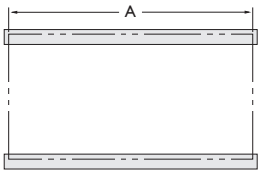
Water quality should be checked regularly for biological contamination. If biological contamination is detected, a more aggressive water treatment and mechanical cleaning program is required. The water treatment program should be performed in conjunction with a qualified water treatment company. It is important that all internal surfaces be kept clean of accumulated dirt or sludge. In addition, the drift eliminators should be kept in good operating condition to minimize water from exiting the evaporative cooling unit in the discharge air.

To minimize the risk of biological contamination, at initial start up or after an extended shut down, it is recommended that the tower be properly treated. Clean all debris such as leaves and dirt from the unit. Completely fill the basin to the overflow level with fresh water. Initiate a biocide water treatment or shock treatment program prior to operating the unit. It is preferable that all such procedures be conducted or supervised by a water treatment specialist.

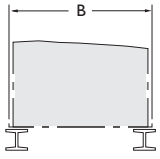
Steel Support

The recommended support for EVAPCO cooling towers is structural "I" beams located under the outer flanges and running the entire length of the unit. Mounting holes, 19mm (3/4") 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 3mm per 2m (1/8" per 6') 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.



Plan View



End Elevation

cAT Supporting Steel Dimensions

Models	**S.I. Units** (mm)		**English Units** (in.)	
	A	B	A	B
*c*AT 17-49 to 17-99	2731	2240	8' 11-1/2	7' 4-3/16
*c*AT 17-511 to 17-911	3188	2240	10' 5-1/2	7' 4-3/16
*c*AT 17-312 to 17-912	3651	2240	11' 11-3/4	7' 4-3/16
*c*AT 17-214 to 17-914	4261	2240	13' 11-3/4	7' 4-3/16
*c*AT 27-518 to 27-918	5486	2240	18' 0	7' 4-3/16

cAT Cooling Tower Mechanical Specifications

Furnish and install as shown on the plans an EVAPCO Model _____ induced draft counterflow cooling tower. Each unit shall have the capacity to cool _____ lps (GPM) of water from _____ ˚C (˚F) to _____ ˚C (˚F) with a _____˚C (˚F) entering wet bulb temperature.

Pan
The pan shall be constructed of G-235 hot-dip galvanized steel for long life and durability. G-235 hot-dip galvanized steel designates an average coating thickness of 2.35 ounces of zinc per square foot on the steel. Standard pan accessories shall include overflow, drain, anti-vortexing hood, Type 304 Stainless Steel strainers, and brass make-up valve with plastic float. The entire pan area shall incorporate a stepped configuration for reduced water volume, lower operating weight and easier pan maintenance. The upper and lower pan bottoms shall be sloped to provide positive drainage of the complete basin section. Depressed side outlet sumps which are not an integral part of the basin shall not be acceptable.

Casing
The casing shall be constructed of G-235 hot-dip galvanized steel. The casing panels shall totally encase the sides of the fill section to protect the surface from direct atmospheric contact.

Fan Motor(s)
_____ kW (HP) totally enclosed fan cooled **(T.E.F.C.)** ball bearing fan motor(s) with 1.15 service factor shall be furnished suitable for cooling tower service on _____ volts, _____ hertz, and _____ phase. Motor(s) shall be mounted on an adjustable base which is mounted on the side of the unit for service. A hinged protective cover shall shield the motor and sheave from the weather.

Drive
The fan drive shall be a multigroove, solid back V-belt type with taper lock sheaves designed for 1.5 service factor of the motor nameplate kW (horsepower). The belt material shall be neoprene reinforced with polyester cord and specifically designed for cooling tower service. A hinged protective cover shall shield the motor and sheave from the weather. 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. All sheaves located in the airstream shall be constructed of aluminum alloy, vented guards shall not be acceptable. If internal belt adjustment is necessary, an internal working platform and ladder is required to access the drive system.

Axial Propeller Fans
Fans shall be heavy duty axial propeller type statically balanced. The fans shall be fabricated by the cooling tower manufacturer for single source responsibility and reliability. The fans shall be constructed of extruded aluminum alloy blades, installed in a closely fitted cowl with venturi air inlet for maximum fan efficiency. Each fan blade shall be individually adjustable. Fan cowl shall be covered with a heavy gauge hot dip galvanized wire fan guard.

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

Fan Drive Warranty
Cooling tower fan drive components shall be covered by a five year manufacturer's plan. Drive components protected by this warranty shall include the fans, bearings, fan shafts, belts, drive sheaves and fan motors.

Fill
The cooling tower fill shall be PVC (Polyvinyl Chloride) of crossfluted design for optimum heat transfer efficiency. The crossfluted sheets shall be bonded together for strength and durability. The fill shall be fabricated, formed and installed by the cooling tower manufacturer and shall be elevated a minimum of 914 mm (3 feet) above the floor of the cold water basin to facilitate cleaning. *The fill shall be suitable for use as a working platform.* The PVC fill shall be self-extinguishing for fire resistance with a flame spread rating of 5 per ASTM E84-81a. It shall also be resistant to rot, decay and biological attack. The fill shall be able to withstand a water temperature of 55°C (130°F).

Non-Corrosive Water Distribution System
Each cell of the cooling tower shall have one (1) hot water return inlet connected to a main spray header. The spray header and branches shall be constructed of Schedule 40 polyvinyl chloride (PVC) pipe for corrosion resistance and shall have a steel connection which is beveled for weld/grooved for a mechanical coupling to attach the external piping. The spray header and branches shall be removable for cleaning purposes and have threaded end caps to allow debris to be removed. The water shall be distributed over the fill by precision molded ABS spray nozzles with large orifice openings to eliminate clogging. The nozzles shall be threaded into the water distribution piping to assure positive positioning. Nozzles shall use fluidic technology to evenly distribute the water over the fill media without any moving parts.

Eliminators
The eliminators shall be constructed entirely of inert polyvinyl chloride (PVC) in easily handled sections and be completely separate from the fill section for maximum efficiency. The eliminator design shall incorporate three changes in air direction to assure removal of all entrained moisture from the discharge air stream. Maximum drift rate shall be less than .001% of the circulating water rate.

Air Inlet Louver Screens
The louvers screens shall be constructed of polyvinyl chloride (PVC) and mounted in easily removable frames on all four sides of the cooling tower for access to the entire basin area for maintenance. The louvers shall have a minimum of two changes in air direction to prevent splashout, block direct sunlight from entering the basin, and have a 19 mm (3/4") opening to prevent debris from entering the basin.

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

Innovation, Performance, Experience

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