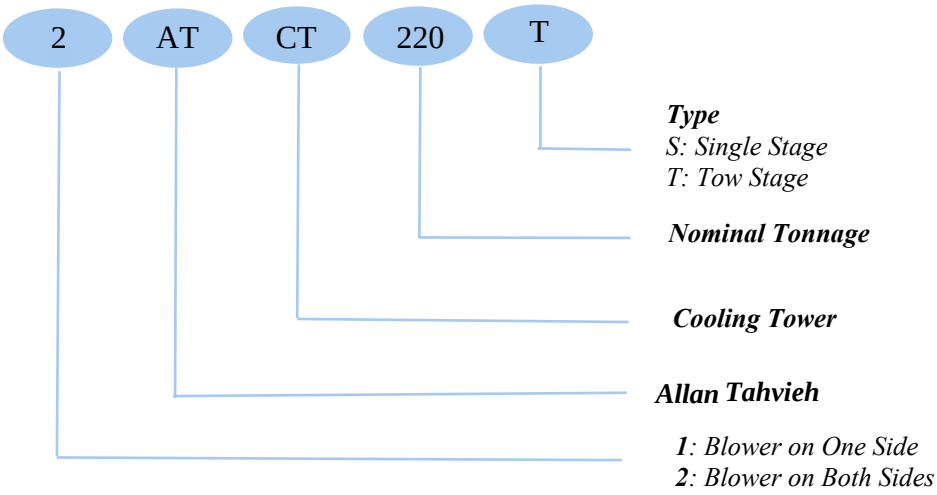
آلان تهویه
Allan Tahvieh

Galvanized Cooling Tower

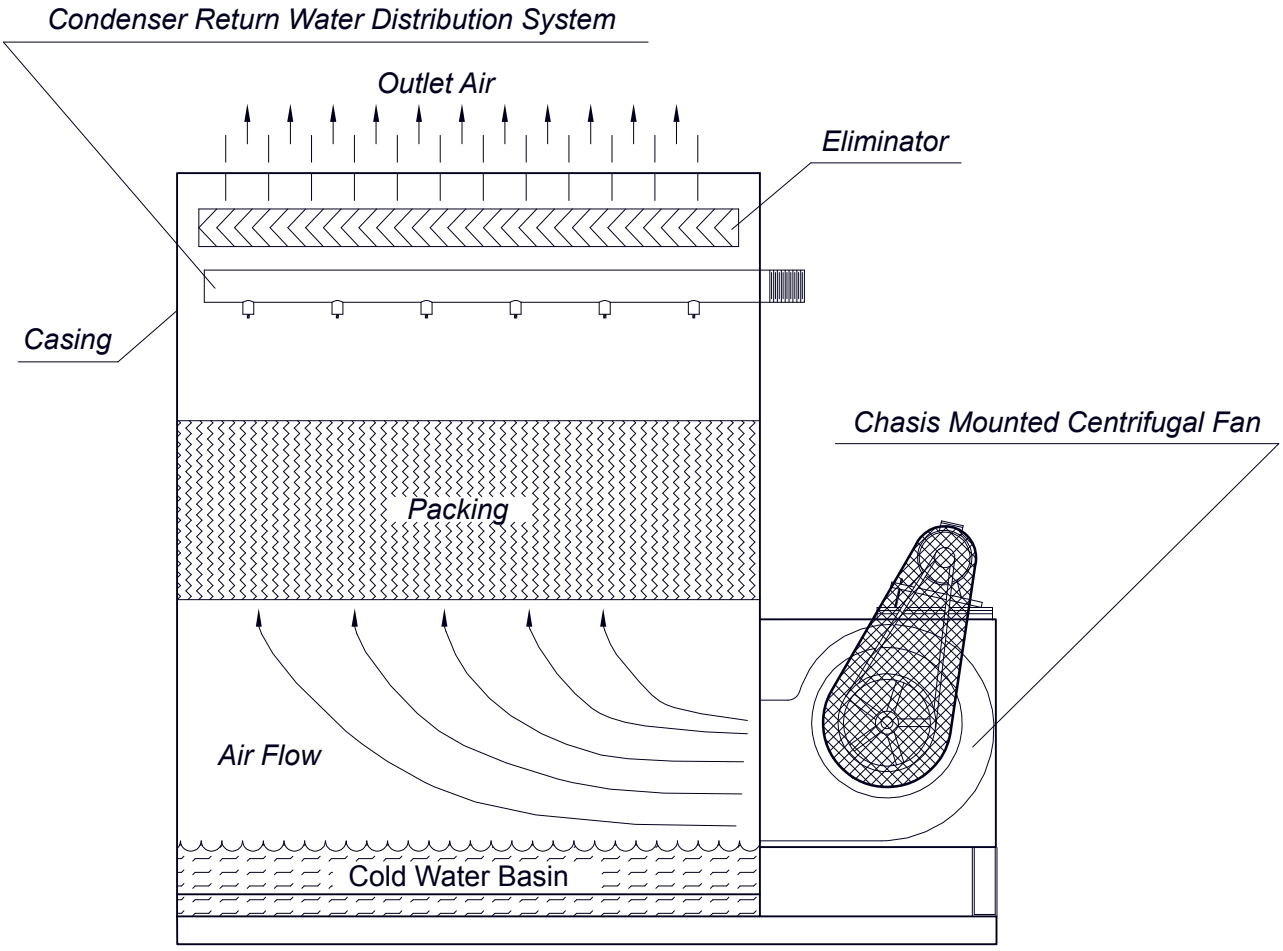
Contents

Nomenclature



Features

Allan Tahvieh Contra-Flow forced draft cooling towers offer durability, High performance, whisper quiet operation, Low water pressure drop and easy of servicing in capacity range of 10 to 1140 tons of refrigeration in two different types of single and two stage.



In Contra–Flow:

Forced draft cooling towers, Air is forced upward through the packing by centrifugal blowers while the return water from condenser flows downward over the cooling surfaces and into the tower basin.

Casing:

Rigidly constructed structure made from galvanized steel sheets to enclose all integral parts except the fan section. Blowers have their own housings.

Water Basin:

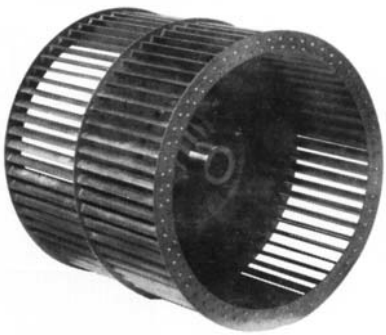
The place in which the cooled water is collected. This section includes water outlet, quick fill and drain connections. The Basin is made from heavy gauge galvanized steel sheets.

Quick Fill:

A connection on the water basin to which a supply of water can be connected for rapid filling of cooling tower basin.

Make Up Water Basin:

The point at which the make up water enters the tower. Through a float valve enough water enters the makeup water basin in order to keep water level at the desired point. In this way any loss of water due to normal evaporation or other causes is compensated. This section includes make up, Over flow and drain connections.



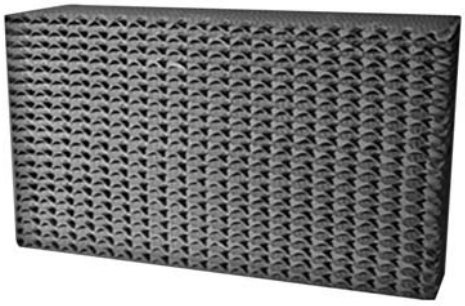
Blower Fan

Blowers:

Double inlet forward curved centrifugal fans, statically and dynamically balanced offering smooth running and quite operation. Fans and fan housing are made from galvanized steel sheets. Drip proof fan cooled, 3phase, 380 volts, 50 Hz electric motors are used to match the required BHP.

Packing (Cooling Surfaces):

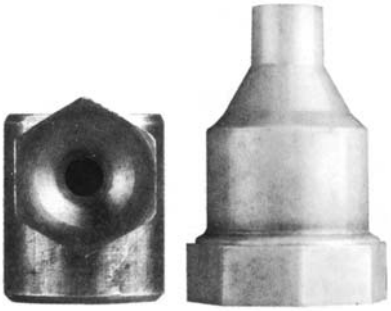
Consists essentially of a system of baffles which slows the progress of the warm water through the tower and ensures maximum contact between water droplets and the cooling air by maximizing surface area and maximizing water film thickness. They are made of PVC.



Packing (PVC) for Cooling Tower

Water Distribution System:

For spread of water entering the cooling tower as evenly as possible over the cooling surfaces, banks of non-clogging nozzles are used to spray the water.



Spray Nozzle

Drift Eliminators:

They are positioned in the outlet air stream above the water distribution system in order to prevent water droplets from being carried away from the tower by the air stream. Eliminator baffles are made of galvanized steel sheets.

Selection Procedure

Definitions:

EWT: Entering Water Temperature (ºF)
LET: Leaving Water Temperature (ºF)
EAT: Entering Air Wet Bulb Temperature (ºF)
Degree Range: EWT - LWT (ºF)
Approach Temp.: LWT - EAT (ºF)

When design degree range does not fit fig.1 ,Use fig.2 and indicate your selection as two stage cooling tower (See Nomenclature).

Given:

To cool 300 GPM of water under following conditions:
EWT= 95ºF, LWT= 85ºF, EAT= 75ºF

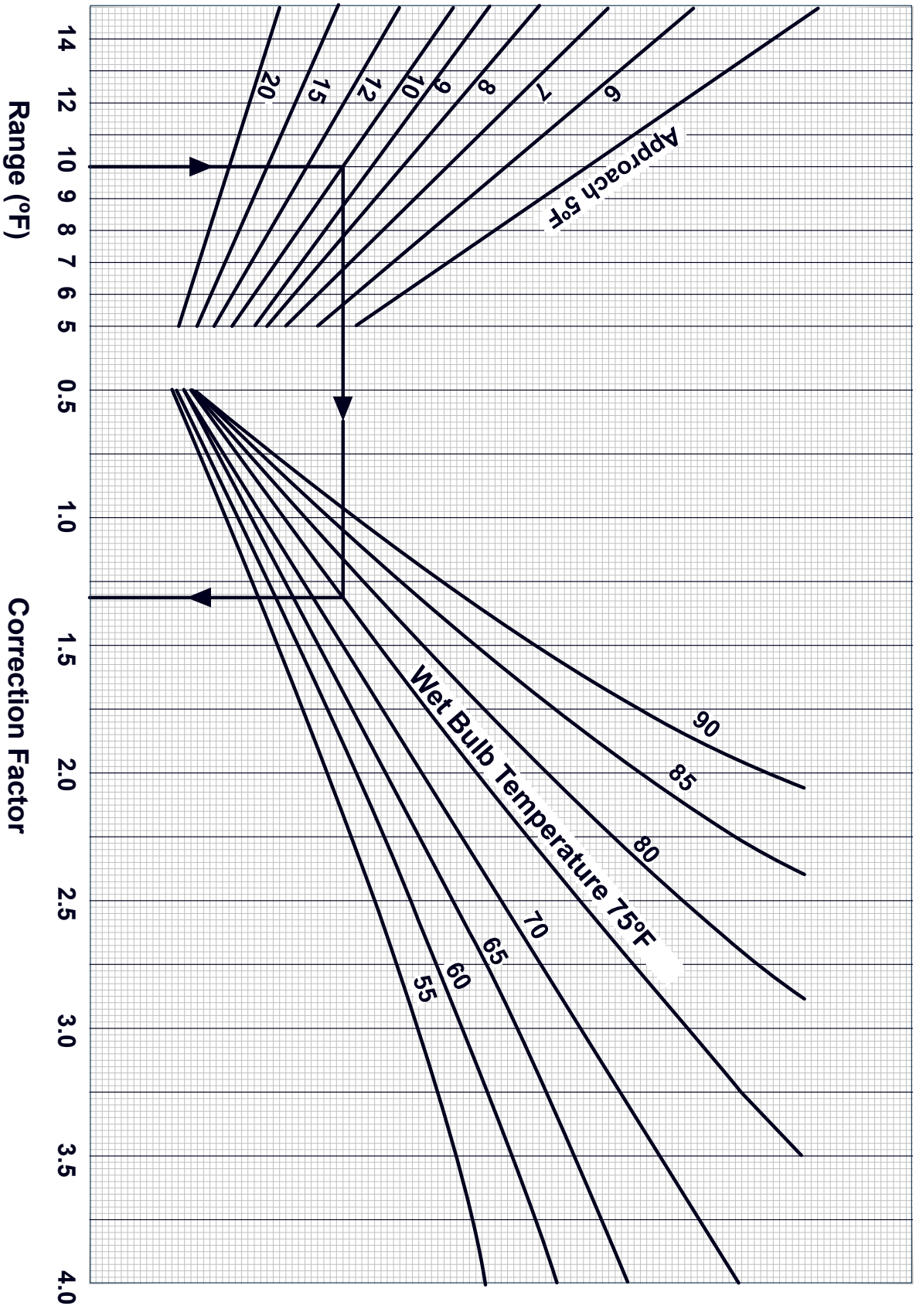
Select the required cooling tower:
Degree Range: 95 - 85 = 10ºF
Approach Temp. : 85 - 75 = 10ºF

From figure 1:
For degree range of 10ºF, Approach Temp. of 10ºF and entering air wet blub temperature of 75ºF, the correction factor read is 1.33

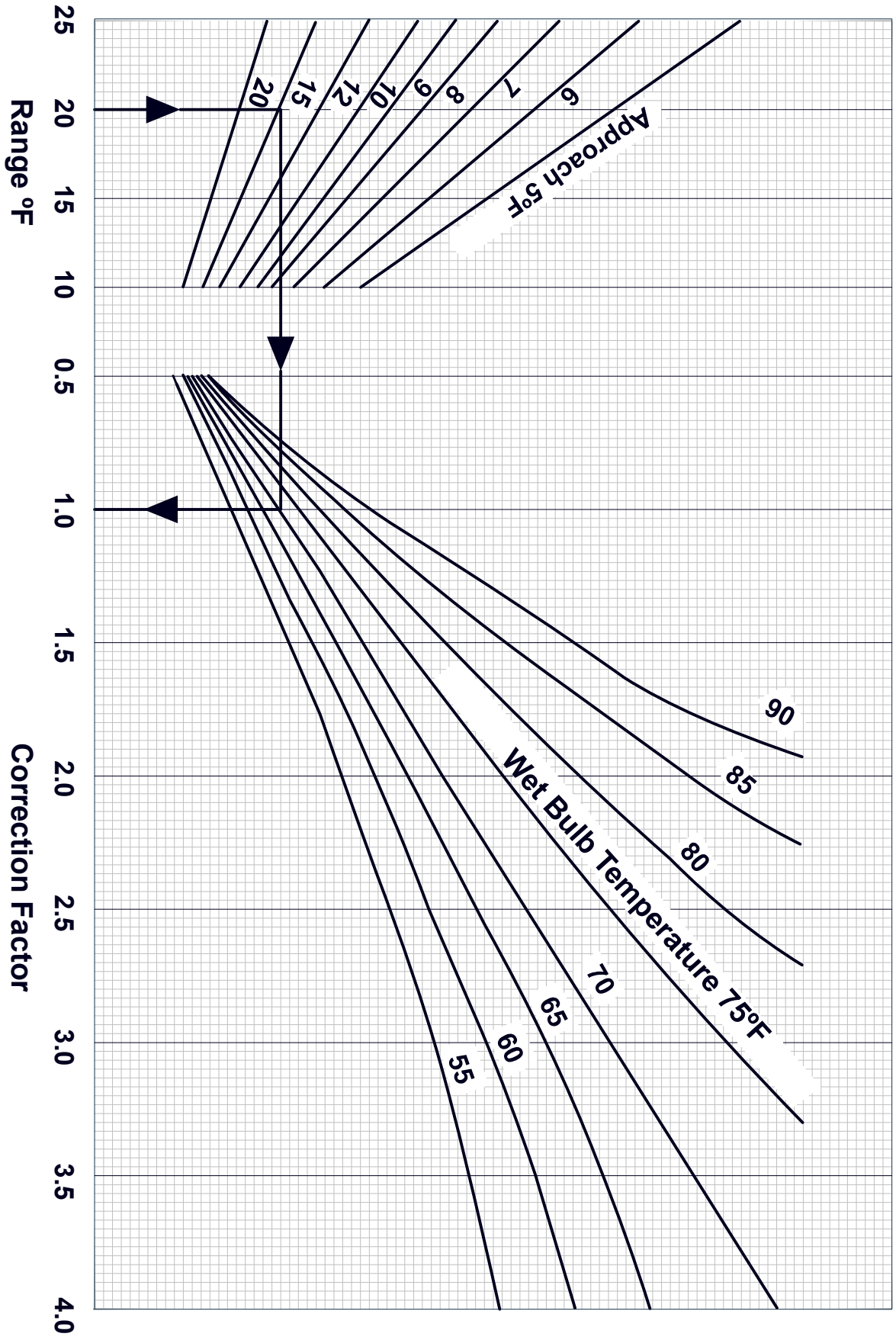
Considering flow rate of 3 GPM per ton of refrigeration: 300/3 =100
Corrected tonnage = 100 × 1.33 = 133 tons.

From engineering data table for cooling tower with blowers on one side, Unit 1ATCT-140S is chosen.

Correction Factor for One Stage Cooling Tower

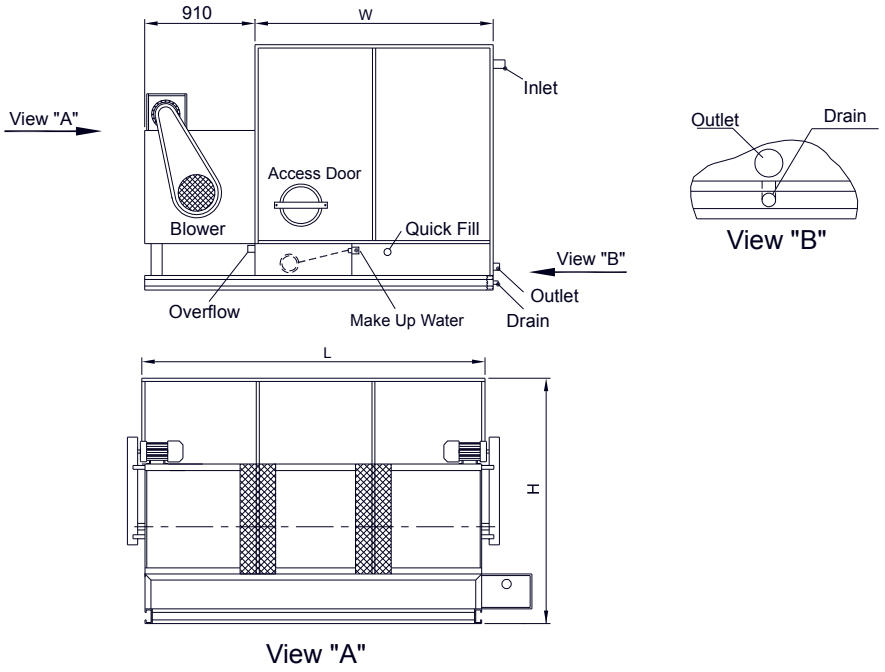


Correction Factor for Two Stages Cooling Tower



Schematic Drawings

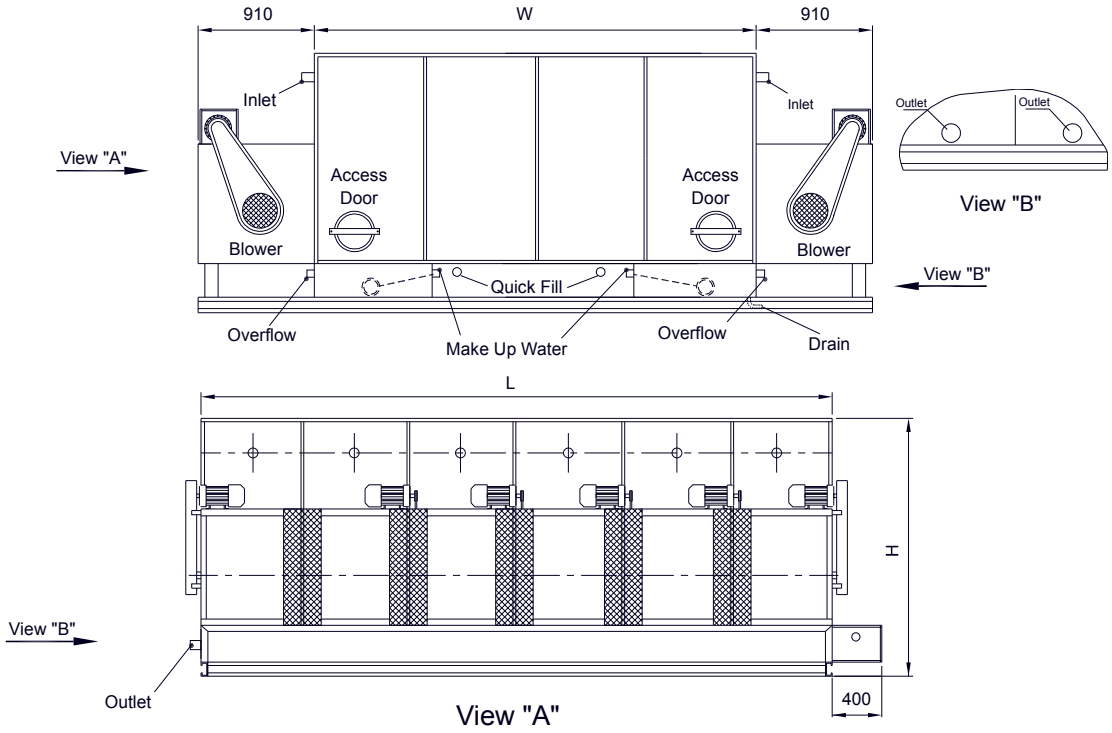
Models with Blowers on One Side



Notes:

1-In model 1ATCT-300 make up water basins are on both sides.
2-In model 60 tons and below, the make up water basin is omitted.

Models with Blowers on Two Sides



Notes:

In models 2ATCT-580 to 1140 make up water basins are on both sides.

Technical Data (Cooling Towers with Blower on One Side)

Model	Cap. (Tons)	Water Flow Rate (GPM)	Blower						Electrical Data			Weight (Kg)			
			No.	Dia. (Inch)	Motor(1)		Motor(2)		System KW Input	Total Amp.	Wire* Size	Single Stage		Two Stages	
					No.	Output(HP)	No.	Output(HP)				Net	Oper.	Net	Oper.
1ATCT-10	10	31	1	13”	1	1	-	-	1.2	2.25	4×1	333	423	373	463
1ATCT-15	15	46	1	17”	1	1.5	-	-	1.5	2.85	4×1	433	533	488	588
1ATCT-20	20	61	1	19”	1	2	-	-	2.1	4.00	4×1	478	648	548	715
1ATCT-25	25	76	1	19”	1	3	-	-	2.9	5.25	4×1	573	773	668	868
1ATCT-30	30	91	1	22”	1	3	-	-	2.9	5.25	4×1	668	1018	773	1123
1ATCT-35	35	106	1	22”	1	4	-	-	3.76	7.50	4×1.5	783	1213	913	1343
1ATCT-40	40	121	1	22”	1	5.5	-	-	4.9	8.90	4×1.5	833	1303	973	1443
1ATCT-50	50	151	1	22”	1	5.5	-	-	4.9	8.90	4×1.5	1003	1633	1183	1813
1ATCT-60	60	181	1	22”	1	5.5	-	-	4.9	8.90	4×1.5	1143	1943	1353	2153
1ATCT-75	75	226	2	22”	1	10	-	-	8.9	16.5	4×4	1428	2423	1683	2683
1ATCT-90	90	271	2	22”	1	10	-	-	8.9	16.5	4×4	1573	2723	1853	3003
1ATCT-105	105	316	2	22”	2	5.5	-	-	9.9	17.8	4×4	1668	3068	2013	3413
1ATCT-120	120	361	3	22”	1	10	1	5.5	13.8	25.4	4×6	2378	4028	2793	4443
1ATCT-140	140	421	3	22”	1	10	1	5.5	13.8	25.4	4×6	2853	4853	3333	5333
1ATCT-160	160	481	4	22”	2	10	-	-	17.7	33.0	4×10	3328	5628	3878	6178
1ATCT-180	180	541	4	22”	2	10	-	-	17.7	33.0	4×10	3378	5678	3958	6258
1ATCT-220	220	661	5	22”	5	5.5	-	-	24.6	44.5	4×16	3393	6793	3703	7503
1ATCT-260	260	781	6	22”	6	5.5	-	-	29.6	53.4	3×25/16	4753	8253	5568	9068
1ATCT-300	300	901	7	22”	7	5.5	-	-	34.4	62.3	3×25/16	5323	9223	6303	10203

Notes:

1- Two 5.5 HP electric motors can be installed in place of 10 HP electric motor when required.

* 2- Wire sizes given are max. Length, of 50 m and maximum ambient temperature of 50ºC.

3 - Consider 23 feet of nozzle head per unit listed.

Dimensions & Connections (Cooling Towers with Blower on One Side)

Model	Dimensions			Connections											
	L	W	H*	Inlet		Outlet		Make Up		Overflow		Quick Fill		Drain	
				No.	Dia.	No.	Dia.	No.	Dia.	No.	Dia.	No.	Dia.	No.	Dia.
1ATCT-10	550	950	2010	1	1 1/2”	1	1 1/2”	1	1/2”	1	2”	1	1/2”	1	3/4”
1ATCT-15	750	950	2010	1	1 1/2”	1	1 1/2”	1	1/2”	1	2”	1	1/2”	1	3/4”
1ATCT-20	1000	950	2010	1	2”	1	2”	1	1/2”	1	2”	1	1/2”	1	3/4”
1ATCT-25	1000	1250	1970	1	2”	1	2”	1	1/2”	1	2”	1	1/2”	1	3/4”
1ATCT-30	1000	1450	2010	1	3”	1	3”	1	3/4”	1	2”	1	3/4”	1	3/4”
1ATCT-35	1000	1750	2010	1	3”	1	3”	1	3/4”	1	2”	1	3/4”	1	3/4”
1ATCT-40	1000	1950	2010	1	3”	1	3”	1	3/4”	1	2”	1	3/4”	1	3/4”
1ATCT-50	1250	1950	2010	1	3”	1	3”	1	3/4”	1	2”	1	3/4”	1	3/4”
1ATCT-60	1450	1950	2700	1	4”	1	4”	1	3/4”	1	2”	1	3/4”	2	3/4”
1ATCT-75	1750	1950	2700	2	3”	1	4”	1	1”	1	2”	1	1”	3	3/4”
1ATCT-90	1950	1950	2700	2	3”	1	4”	1	1”	1	2”	1	1”	3	3/4”
1ATCT-105	2400	1950	2700	3	3”	1	4”	1	1”	1	2”	1	1”	4	3/4”
1ATCT-120	2900	1950	2700	3	3”	1	5”	1	1”	1	2”	1	1”	4	3/4”
1ATCT-140	3350	1950	2700	4	3”	1	5”	1	1”	1	2”	1	1”	5	3/4”
1ATCT-160	3850	1950	2700	4	3”	2	4”	1	1”	1	2”	1	1”	5	3/4”
1ATCT-180	4080	1950	2700	5	3”	2	4”	1	1”	1	2”	1	1”	6	3/4”
1ATCT-220	4800	1950	2700	5	3”	3	4”	1	1”	1	2”	1	1”	6	3/4”
1ATCT-260	5750	1950	2700	6	3”	3	4”	1	1”	1	2”	1	1”	7	3/4”
1ATCT-300	6700	1950	2700	7	3”	3	5”	2	1”	2	2”	2	1”	9	3/4”

Note:

* 1- Add 300 mm to “H” Dimension for additional stage.

2- All entries subject to change without notice.

Technical Data (Cooling Towers with Blower on Both Sides)

Model	Cap. (Tons)	Water Flow Rate (GPM)	Blower						Electrical Data			Weight (Kg)			
			No.	Dia. (Inch)	Motor(1)		Motor(2)		System KW Input	Total Amp.	Wire* Size	Single Stage		Two Stages	
					No.	Output(HP)	No.	Output(HP)				Net	Oper.	Net	Oper.
2ATCT-340	340	1021	8	22"	8	5.5	-	-	39.2	71.2	3×25/16	6178	10678	7258	11758
2ATCT-400	400	1201	10	22"	10	5.5	-	-	49.0	89.0	3×35/16	6653	12153	8003	13503
2ATCT-450	450	1351	12	22"	12	5.5	-	-	58.8	106.8	3×50/25	8553	15353	10118	16918
2ATCT-500	500	1501	12	22"	12	5.5	-	-	58.8	106.8	3×50/25	8553	15353	10118	16918
2ATCT-580	580	1741	14	22"	14	5.5	-	-	68.6	124.6	3×70/35	9503	17003	11368	18868
2ATCT-660	660	1981	16	22"	16	5.5	-	-	78.4	142.4	3×70/35	11878	20878	14013	23010
2ATCT-740	740	2221	18	22"	18	5.5	-	-	88.2	160.2	3×95/50	13303	23303	15693	25693
2ATCT-820	820	2460	20	22"	20	5.5	-	-	98.0	178.0	3×120/70	14728	25728	17388	28388
2ATCT-900	900	2700	22	22"	22	5.5	-	-	107.8	195.8	3×120/70	16153	28653	19068	31568
2ATCT-980	980	2940	24	22"	24	5.5	-	-	117.6	213.6	3×150/70	16628	30128	19803	33303
2ATCT-1060	1060	3180	26	22"	26	5.5	-	-	127.4	231.4	3×150/70	19003	34003	22448	37448
2ATCT-1140	1140	3420	28	22"	28	5.5	-	-	137.2	249.2	3×150/70	20903	36403	24603	40103

Notes:

1- Two 5.5 HP electric motors can be installed in place of 10 HP electric motor when required.

* 2- Wire sizes given are max. Length of 50 m and maximum ambient temperature of 50ºC.

3 - Consider 23 feet of nozzle head per unit listed.

Dimensions & Connections (Cooling Towers with Blower on Both Sides)

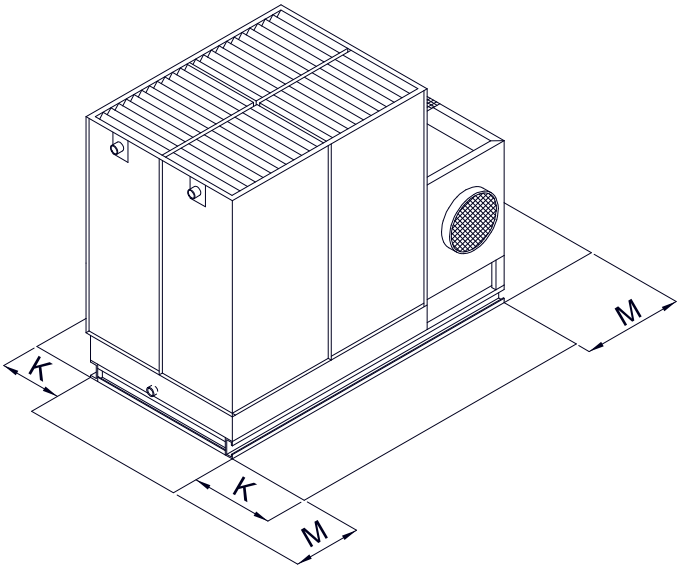
Model	Dimensions			Connections											
	L	W	H*	Inlet		Outlet		Make Up		Overflow		Quick Fill		Drain	
				No.	Dia.	No.	Dia.	No.	Dia.	No.	Dia.	No.	Dia.	No.	Dia.
2ATCT-340	3850	3860	2700	8	3"	4	5"	2	1"	2	2"	2	1"	10	3/4"
2ATCT-400	4800	3860	2700	10	3"	4	5"	2	1"	2	2"	2	1"	12	3/4"
2ATCT-450	5750	3860	2700	12	3"	4	5"	2	1"	2	2"	2	1"	14	3/4"
2ATCT-500	5850	3860	2700	12	3"	4	5"	2	1"	2	2"	2	1"	14	3/4"
2ATCT-580	6700	3860	2700	14	3"	4	5"	2	1"	2	2"	2	1"	16	3/4"
2ATCT-660	7650	3860	2700	16	3"	4	5"	2	1"	2	2"	2	1"	18	3/4"
2ATCT-740	8600	3860	2700	18	3"	6	5"	2	1"	2	2"	2	1"	20	3/4"
2ATCT-820	9550	3860	2700	20	3"	6	5"	2	1"	2	2"	2	1"	22	3/4"
2ATCT-900	10500	3860	2700	22	3"	6	5"	2	1"	2	2"	2	1"	24	3/4"
2ATCT-980	11450	3860	2700	24	3"	6	5"	2	1"	2	2"	2	1"	26	3/4"
2ATCT-1060	12400	3860	2700	26	3"	6	5"	2	1"	2	2"	2	1"	28	3/4"
2ATCT-1140	13350	3860	2700	28	3"	6	5"	2	1"	2	2"	2	1"	30	3/4"

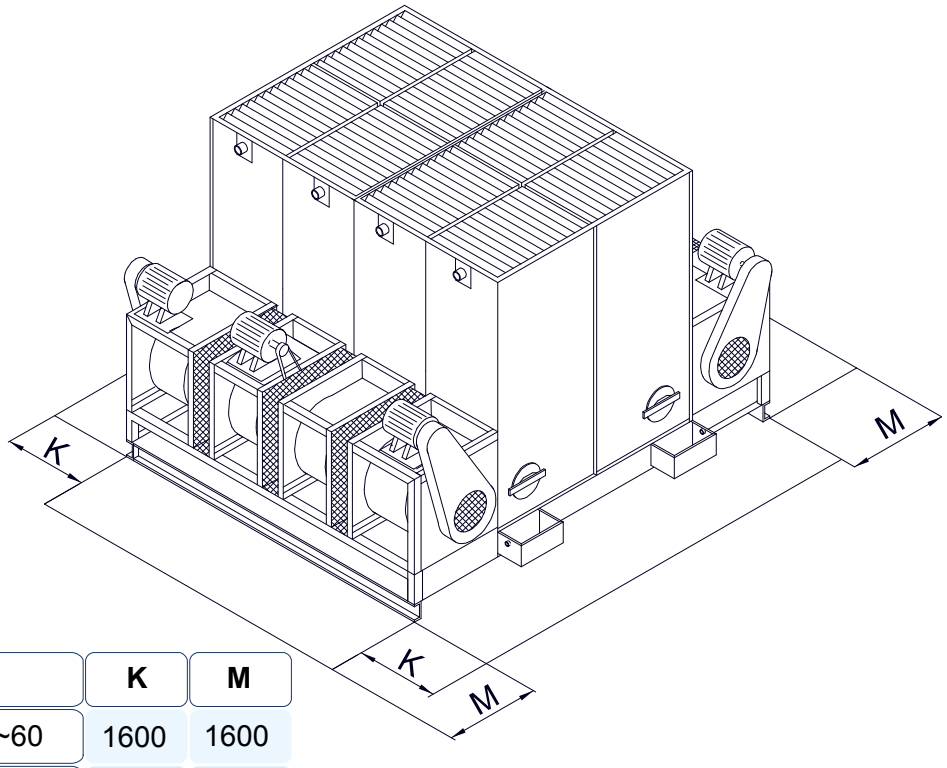
Note:

* 1- Add 300 mm to "H" Dimension for additional stage.

2- All entries subject to change without notice.

Recommended Air Circulation and Service Area





1AT

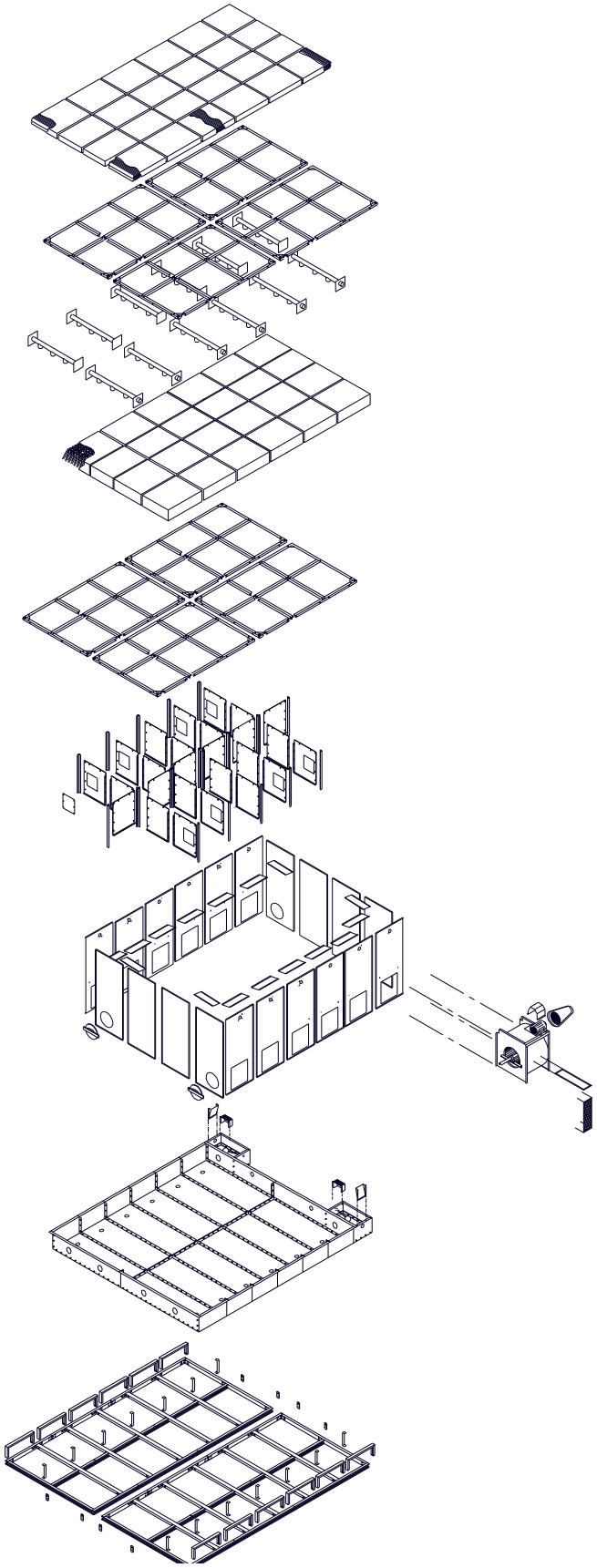
Model	K	M
1ATCT-10~60	1600	1600
1ATCT-75~300	2600	2100
1ATCT-340~1140	2600	2100

Notes:

1- Allow a distance of 2500 mm between cooling towers at installation.

2- Dimensions are in mm.

Schematic Exploded Drawing of Cooling Tower



Eliminator

Body Internal Frame

Nozzle

Packing

Body Internal Frame

Fan Divider Plate

Body

Complete Blower Unit

Water Basin

Chasis