Auto-balance full-filmed Cooling Tower

With the many patent technology, ACEC auto-balance full-filmed cooling tower developed the innovation self-balance water system, which solved the problem of inlet/outlet water imbalance of cooling tower. Cooling efficiency increased significantly.

- Precise sheet metal structure;
- Cooling water can adjust automatically according to the load of the end machine;
- Linked canal water plates/water collecting plates insures the uniform water distribution under different load;
- Two size eddy guiding nozzles realize the full-film of fill, and good cooling performance;
- Simplified pipe arrangement, valve is not needed anymore;
- Realize frequency conversion of cooling pump.

**Technical Advantage**

- Solve the problem of water imbalance of traditional cooling tower when the system flow varied;
- Uniformed film on filler, full-film can be realized when the system flow is over 15%;
- Segmental cooling performance reach 90%~105%.

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**Optimized design for excellent performance**

**Self-balance water system**

1. Inlet between tower units, for water balance of both sides
2. Linked water plates, for water balance of tower units
3. Inlet water filter, for stable water flow and avoid nozzle block
4. Two size eddy guiding nozzles, for uniform film on filter
   - Larger spray range, 130% ~ 250% of the traditional ones
   - Optimized arrangement of the nozzles, insures the effective water spray and uniform film on filter even when the system flow below.
5. High quality filler, hanging fixed, collect water at both sides
6. Linked water collection plates, centralized outlet water
7. Centralized big float valve, accurate water level control
8. 2nd filter – filter before pump is not needed, energy consumption of pump is lowered

**Stable tower structure**

9. Safety stairs and handle is standard
10. Cover on water plates, more operation space on tower and avoid water plant
11. International high efficient motor and fan, for lower noise
Self-reliance rectifier check valve

ACEC cooling tower is designed as linked chamber. Self-reliance rectifier check valve can be adapted to each fan, and can automatic switch on/off according to the fan, which result in the linked chamber of the tower units with optimized wind flow, and the wind pressure and speed are increased at the same time. Effective filler usage of cooling tower according to the demands of system heat load is realized. Through adjusting number of fan units, the system can operate with high efficiency and energy saving.

**Technical Performance:**
- The fans of valve are running in the same angle and track, to insure the optimized wind flow;
- The valve are switched on when the fans switched on;
- The valve are switched off when the fans switched off, to avoid heat back;
- No matter how many fans are in operation, all the filler can be fully used for heat transfer to achieve higher cooling efficiency;
- Fans can be as backup to each other, and the system are more stable;
- Patented valve technology, precise design and machining;
- The fans of valve are in aluminum-magnesium alloy, corrosion preventive and long life.

**Technology Advantage:**
- Closed tower, avoid sunlight, and outdoor fog, dust as well as water plant
- Reduce the work for water treatment
- Avoid heat back
- 10 years maintenance free even in severe environment
- Nearly no air drag is measured when air valve is running
- Air volume increased 3.5~18%, when fan partly running;
- The deviation of each fans is lower than 13.4~13.3%, when more than 20% fans are running
- Adjust range of fans are larger than the traditional ones.
### Technical Data

#### Parameter of AC Etrials

<table>
<thead>
<tr>
<th>Model</th>
<th>Standard Flow</th>
<th>Fan Diameter</th>
<th>Fan Motor</th>
<th>Dimensions</th>
<th>Inter Others</th>
<th>Head of Delivery</th>
<th>Weight</th>
<th>Noise</th>
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*For the L, W, H1/2, please take the drawing on P8 as reference.

#### Design Environment:
- Inlet temperature T1=37°C; Outlet temperature T2=32°C; Wet bulb WBT=28°C; Air pressure P=994.00Pa

#### Selection Mode:
1. The total flow of cooling system Q should be determined by the accumulation of all the equipment to be cooled.
2. The minimum heat loading and adjust range should be determined by the application and energy-saving operation requirements, then select the model tower unit design; (number of units N, 3≤N≤10)
3. According to the set-up environment, mode of tower unit Q1, number of tower units N, number of tower groups C;
   - (When N>10, separate into 2 groups; N>20, separate into 3 groups...)
4. According to the over capacity principle, Q1×N>Q, over capacity≥10%
5. When Q>1, electric switch valve should be equipped to each main pipe.
6. To ensure smooth system operation, a pressure pump should be added to the supply pipe, if the pressure for cooling water supply is low.
7. Pressure pump with control is an optional component, should be noted before order.

#### Example:
Take a system with total flow of 2000m³/h as an example, you can choose 8 sets AC-250T (250m³/h) units, or 4 sets AC-500T (500m³/h), if space is limited.
Performance

The actual cooling performance and approach of the ACEC tower, as well as the performance evaluation based on environment can be displayed automatically. The relationship of approach to wet bulb of ACEC tower under different system flow is as below:

Example: 4 air-ones, with 4 cooling towers and 4 pumps, the performance of ACEC towers and traditional towers under different system flow are as below:

Conclusion: Compare with the traditional units, under system load of 25%~80%
- Cooling performance increased 13%~157%.
- COP of the whole system increased over 10%~35%.
- Return of investment at around 2 years (according to system load and operation time)