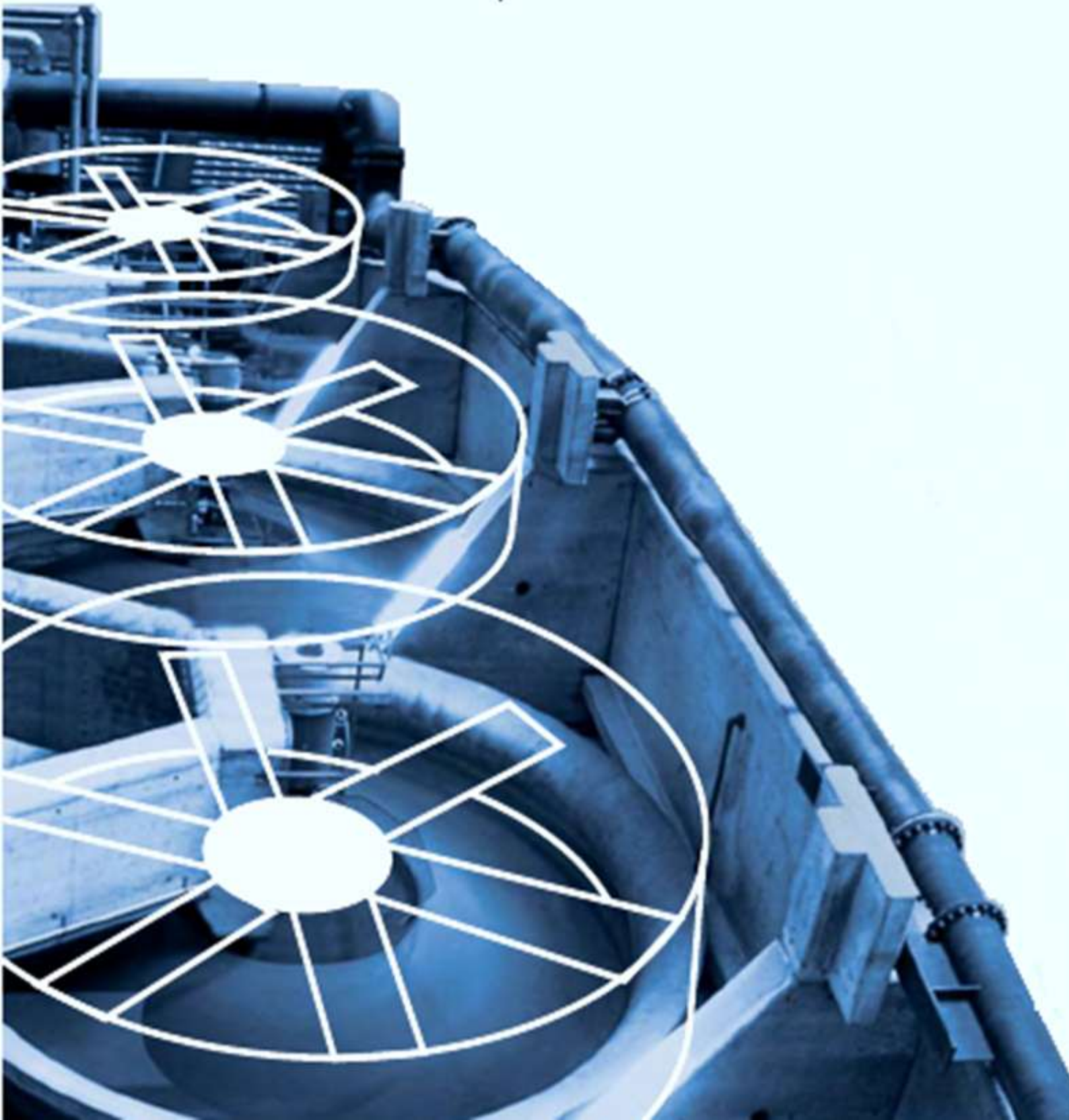


Harrison

Counter Flow Closed Circuit Cooling Tower



What is a Closed circuit Cooling Tower (CCT)?

- **Closed circuit Cooling Towers** are hybrids that pass the working fluids through a tube bundle, upon which clean water is sprayer and a fan-induced draft applied.
- The resulting heat transfer performance is much closer to that of a wet cooling tower, with the advantage provided by a dry cooler of protection the working fluid from environment exposure and contamination.
- The warm water can be cooled to a temperature lower than ambient air dry-bulb temperature, if the air is relatively dry.
- As ambient air is drawn past a flow of water, the water droplets over the tubes evaporate, the energy required by that portion of water to evaporate is taken from the remaining mass of water reducing the temperature. Evaporation results in saturated air conditions, lowering the temperature of water process by the tower to a value close to wet bulb air temperature, which is lower than the ambient dry bulb air temperature, the difference determined by the humidity of the ambient air.

Why choose HCCT?

- Comparing other same class cooling tower, largest eat exchanging area and efficient.
 - Stable Structural mainframe prevent from intensive gale.
 - Easy to access and sweep.
 - Corrosion-free leak free service.
 - Short lead time.
 - Holistic Cold Water basin and no water splash.
 - Quick installation, Quiet operation and Low maintenance costs.

Reliable Mainframe

- HCCT heavy duty steel structural framework are designed to meet the customer's requirement for bearing the extreme wind and impact circumstance. Compared with existing cooling tower, JNC decrease the parts in quantity more than 30%. Less frame parts means less labors needed on assembly and maintenance, and also means less cost.

- For application under extremely corrosive condition, SUS304 steel framework is available.



Single Piece Shell and Basin



- FRP basin and casing with single piece guarantee leak free operation and corrosion protection. The basin is leak tested at the factory and is provided two years leak-proof of guarantee.

- Casing contains stable material resisting ultraviolet radiation, therefore they have smooth and clean surface, and it is able to bear aging

with a high polish going through a long time.

Water Distribution System



- HCCT cooling tower distribution system consists of gravity distribution with large orifice nozzle, which greatly reduces clogging and assure constant performance capacity between maintenance intervals. When nozzle cleaning is required, each nozzle can be easily removed in place and cleaned.
- They are engineered to produce maximum uniformity of water dispersion with the minimum vertical distance by deflecting water flow vertically and laterally, offering more available tower height for fill slat installation.
- Hot water basin is equipped with standard covers, which could prevent water from being polluted by impurities in the air, and reduce dirt accumulation in hot water basin.

Highly efficient axial air-foil fan blades

• Airfoil-shaped blades are totally fabricated from extrusion Aluminum Alloy. Fan hubs are fabricated with hot-dip galvanized circular plate. The aerodynamic shape together with the lower tip speed ensures a lower noise level. The fan is adjustable for permitting maximum utilization of rated horsepower and optimum performance.



• Advantages: High efficiency, lower tip speed, light weight, lower power consumption, low noise, low vibration. In case of most noise sensitive area, super-low noise fan application is available, which made by FRP material.

Easy Maintenance of Moving Parts

- HCCT motors are located on the outside of the unit. Compared with the motor inside the fan section, it is easier to remove and repair it. Outside installed motor as no trouble of the hot moist air. Quiet operation of the motor is achieved through carefully designed and controlled manufacturing methods of components.
- We have different kinds of motors to meet our customer's needs.



HCCT Specially Designed Parts

- Open grooves at the bottom of HCCT open type tower's infill and then put the pipe coil heat exchanger inside the grooves; The sprinkling water is firstly cooled by the top infill and then go across the surface of pipe coil, which can increase the drive force of heat exchanging of the pipe coil and greatly improve the heat discharge efficiency on unit area. This is the Technology Core of HCCT series closed circuit cooling tower.
- The inlet and outlet pipe end of the pipe coil cell is bell-mouthed plus nut-shaped. Near to the pipe end is a section of morie pipe used to adjust the position of inlet and outlet pipe end. And then use H-shaped pipe, vertical pipe and U-shaped pipe among the morie pipes to connect into the pipe coil cell. And finally use the metal anchor groove to fix the vertical pipes at a certain distance. This kind of pipe coil cell is shunt-wound for upper and down routes and the distance & resistance is also same for each route.
- This innovative design make it easily to assemble and replace the pipe coil cell and make the construction compact, which is good for release of air or water. Also this design can combine freely between the pipe coil cells or between pipe coil cell and sprinkling infill to improve the heat discharge efficiency on unit area.

High-efficient sprinkling pump

- Use imported brand pump or the same grade high-efficient sprinkling pump special for closed circuit cooling tower to ensure that the HCCT tower can be high-efficient and low energy consumption as well as reach the designed sprinkling water flow.
- The motor of the sprinkling pump is TEFC with IP55 protection class. The mechanical seal and bearing use top brand to ensure the pump can run long time at low noise position.



Mechanical Parts



- Pulley has passed dynamic balancing test, which could guarantee its quiet and vibration less operation.
 - HCCT cooling tower's grease lubricator can provide the grease automatically and continuously for the fan shaft bearings. Since it is located outside fan stack, it will save a lot of manual work and make the maintenance more efficient.
- Totally enclosed bearing with heavy duty self-aligning ball type is designed for a minimum 75,000 hours life span. Cast iron housing and flexible cap protect the bearing from extreme environmental attack such as rain, vibration and various kind of impact.

Working Platform

- In order to make maintenance more convenient, HCCT series has provided a working platform.
- The platform is located between two access doors; its width and length have made it possible for people to check every parts of the tower.
- Big access door has made it easier for people to come in and out; this advantage allows the maintenance without shutting down the cooling tower.

Water Level Control System

- Automatic make-up system can adjust water level.
- It as the long term continuous water level demonstration function and can be connected with BA, it is thus monitored together.
- When it exceeds the upper and lower part of the normal water level, the alarm will sound automatically.
- It is not influenced by the water pressure. It saves water and is economical.
It can efficiently monitor the water level of the cooling tower and prevent the water level inside the cooling tower and prevent the water level inside the cooling tower being too low. Water level being too low or too high will cause emptiness or water overflow.

Mechanical parts protection

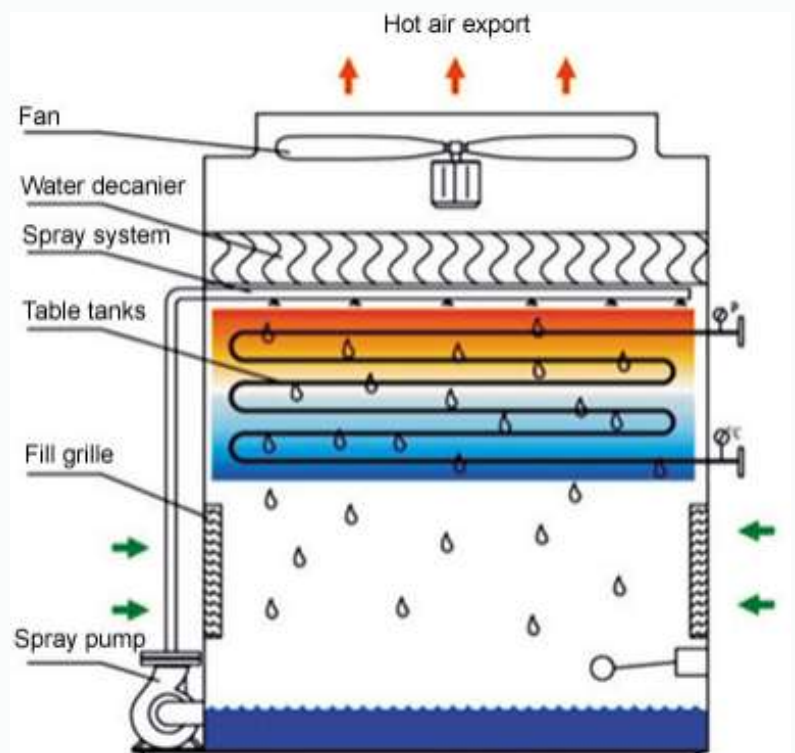
- Since cooling towers are installed outside, mechanical parts are always exposed under extreme circumstance such like rain, wind, sunbeams etc. JNC mechanical parts are perfectly protected from any danger by pulley cover, motor cover, belt cover and any others protective equipment.

Low Noise Operation

- Carefully selected HCCT series mechanical parts guarantee optimum thermal performance with minimal sound level.
- The low sound level generated by HCCT series make them suitable for installation in most environment concern.
- For a very sound sensitive environment, HCCT series service various sound isolating solutions. Super low noise fan and stack extension option significantly reduce the sound levels generated from the tower with minimal thermal performance losses.
- Super low fan noise.
- Stack Extensions.
- We also provide various kinds of vibration isolators according to customer's needs
- HCCT vibration isolators specifically designed for cooling tower spring and rubber integrated type. It is combined advantage of high frequency isolating and sound-proofing function.

Advantages of Counter Flow Closed Circuit Cooling Tower

- Smaller tower height due to compact infill.
- More efficient air/water contact due to droplet distribution.
- Well-designed water distribution system to make sure uniform distribution Of water.
- Use of high quality nozzles which ensure complete breakdown of the water droplet in order to increase heat transfer.
- Water Saving: HCCT systems adopt 100 % closed circuit circulation for process fluid that saves from loss in any form. Special baffles are used to reduce unavoidable spray water loss to the lowest point without negative impact on the cooling efficiency.



Important points to note when assembling, operating and maintenance

- Cooling tower's installation, maintenance and inspection need to be done or guided by professional person familiar with cooling tower knowledge.
- Pay attention to some relevant measures (such as fireproof measures) when transport, hook up, install, operate, maintain and repair cooling towers.
- Be sure to read the operation and maintenance manual before operating the towers. Please obey the forbidden items and the operation guidance.
- Do not enter cooling tower or climb onto the top during operation.
- When maintenance, please cut down all power, make some obvious sign in power switch and have some people to guard to avoid open the power wrongly.
- Do not drink water in the cooling tower; wash your eyes immediately if it enters your eyes. Gargle and wash your hands after your job.
- Please obey the admonitory remarks stuck on the cooling tower body.
- In cold area, please add the electric heater when using tower in winter to avoid icing, and also need to have the safety protection control equipment. When don't use the tower, please open the deflation pipe and release the water inside the pipe coil and water basin. For more measures, please refer to the operation and maintenance manual or consult to Harrison Cooling Tower Company.





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