

LCC MODEL

CLOSED CIRCUIT

COOLING TOWER



LCC Model Closed Circuit Cooling Tower



Applications

When the cooling tower is in operation, the cooling water is susceptible to environment pollution. Closed circuit cooling towers are used to avoid the generating of deposits and scales because of the direct contact between the cooled fluid and air. This will avoid clogging and corroding problems. This closed circuit cross flow tower is required in those areas with poor water quality or when the cooled fluid or equipment will tolerate no pollution at all.

Features

Unique Development and Perfect Design

LCC tower is a new product through continuous improvement and development by cooperating with Industrial Technology Research Institute of Ministry (I.T.R.I.) of Economics Affairs. LCC tower uses a cross-flow and low noise design with light modular assembly and structure so that the installation can be easily completed at site. Two patents have been acquired for this LCC tower (Patent no: new type no. 153872 and 177859)

Durability and Minimum Maintenance

The internal coils of LCC tower is using seamless tubes and deoxidized copper that are very good at resisting corrosion. The steel parts are hot-dip galvanized. The side plates and inlet louver are made of UPVC plastic that is very capable to resist ultraviolet rays.

Fan stack, water basin and access door are made by fiber-glass reinforced polyester. All these materials are durable with long life-cycle.

Water pump for secondary circulation is integrated with outdoor TEFC motor and bronze propeller that can resist corrosion.

High-efficient performance, space saving and easy piping new heat exchanger and spraying method are applied to tremendously increase the heat transfer efficiency and can save 15% of space and weight than conventional towers. All the nozzles of piping are located on the lower of cold water basin and are convenient for piping.

Low Operation Cost and Least Power Consumption

High-efficient and low-noise fan are applied to go with the new heat exchanger rendering low static pressure and least power consumption. For a long term operation, not only is the noise level low but also the power consumption is significantly lowered, so that the lower cost is rendered.

Well-performed Condenser and Clean Circulation Water

Cooling water is circulating in the coils without any contact with the ambient air so that the water can be kept clean forever. Also it can prevent condenser and pipes from scaling and affecting thermal performance. Therefore, the condenser can perform efficiently so that the power consumption is low. In addition, the frequent cleaning is not necessary and the maintenance cost can be decreased.

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Structure

Motor

Outdoor TEFC design is applied.

Transmission Unit

Axial design fan can be adjusted for air volume based on actual operation. Multi-belt driven speed reducer has high contact area, low vibration and smooth transmission. The belts are protected by FRP case from damping and sliding.

Tower Structure

The supporting structure and basin supporters are made of hot dip galvanized steel so that the tower can withstand strong wind and vibration. The cross flow type heat exchanger is applied so that the air can horizontally enter from both sides and make direct contact with the falling water from hot water basin. Thus, the heat is expelled out of the tower by fan accordingly. The access door and walkway is set up inside the tower to make maintenance and cleaning easier.

Water Distribution

Hot water basins are placed on both sides of cooling tower and the distributed hot water is falling into the tower by gravity force. Distribution boxes and flow control valves are installed to equalize the water flow of both sides to reduce inlet water pressure and evenly distribute the water onto filling and cooling coil and thus to achieve the best heat exchanging and prevent from water splashing.

Cold Water Basin

The interior of this basin is made of F.R.P. material and supported by light hot dipped galvanized steel. The piping includes auto makeup, manual makeup, overflow and drain. The internal walkway is installed for easy maintenance and cleaning. The partition between basins can be installed for multi-cells tower so that the system operation will not be influenced when doing maintenance and cleaning for single cell or portion of whole tower.

Filling

Vacuum-formed P.V.C. fillings are glued together on the surface with certain pitch so that it is not easy to get scale build up and clogged. This makes for even water distribution and heat transfer.

Cooling Coils

The cooling coils are made from seamless tubes and deoxidized copper that can withstand high pressure and render best heat transfer and corrosive resistance. In addition, the coils are secured by strong SST shelves and installed by divided packs so that they are easy for erection and maintenance. The exhaust valve and expansion are placed on the topmost to expel the air in the pipes smoothly and besides, the volumetric change of circulation water caused by various seasons or water temperature can be modulated through expansion tank to avoid piping deformation caused by pressure. The coils are designed with multi-sectional and up-and-down separate layers so that the system heat in the tubes can swiftly be transferred to cooling water outside and exhausted to ambient air through filling. Thus, the best cooling effectiveness can be achieved.

Side Plate and Inlet Louver

Side plates and P.V.C inlet louvers are capable of acidity resistance, alkalinity resistance, weather-proof, corrosion-proof, and ultra violet prevention.

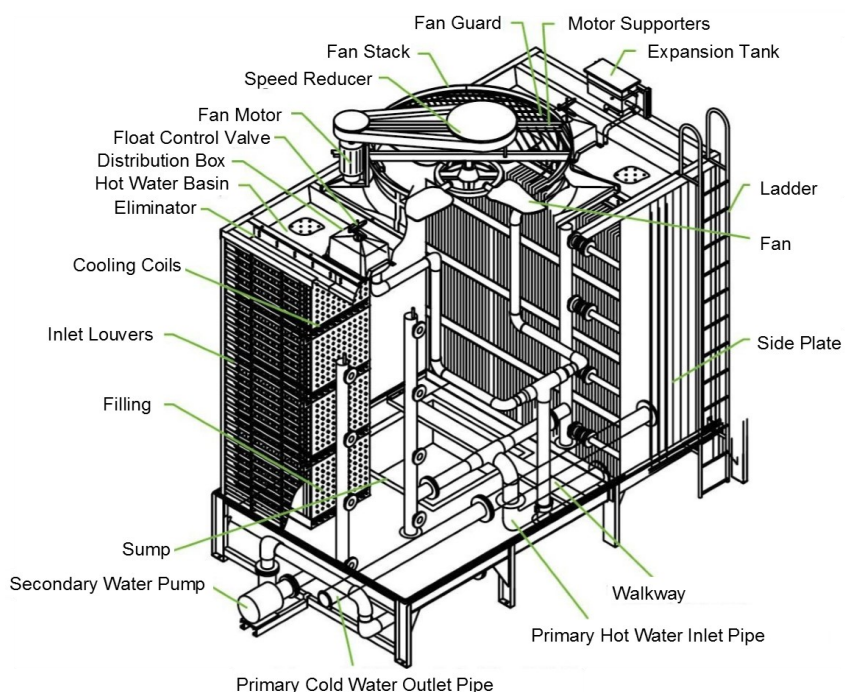
Piping

Primary piping is for the ends of inlet water and returned water of condenser system and is located below the cold water basin for easy and quick piping. The secondary piping including the water pump is for the cooling circulation water of heat transfer and uses internal design to avoid secondary piping. Thus, the cooling tower looks tidy and artistic.

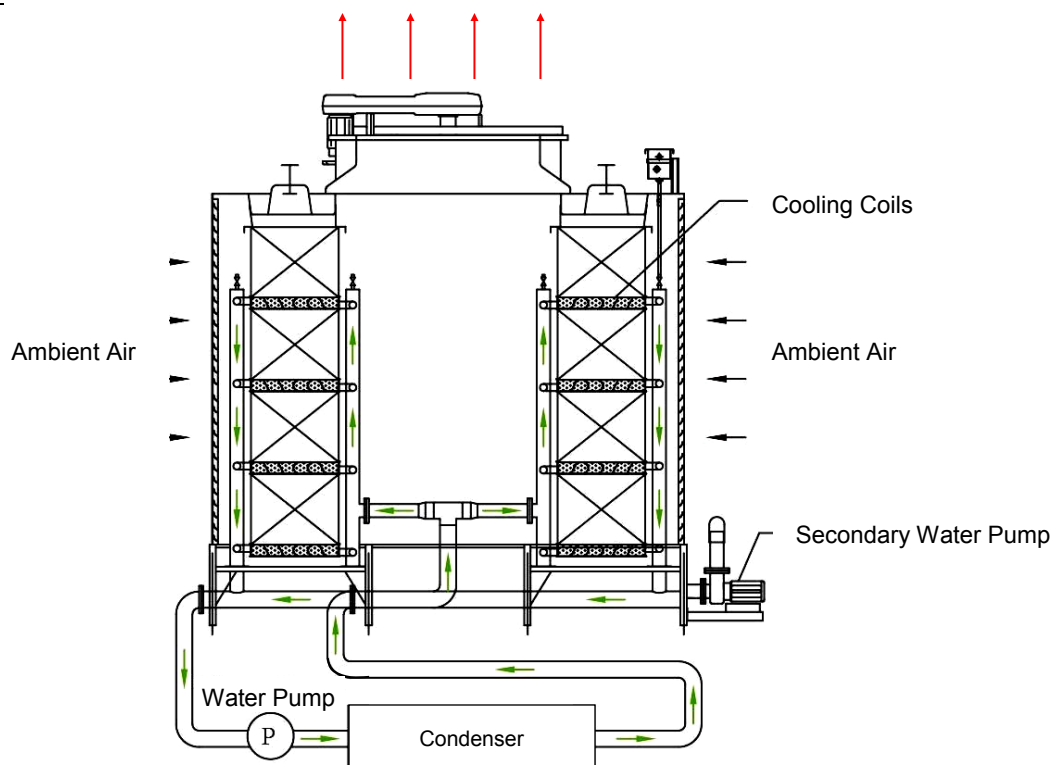
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Cooling Tower Diagram & Materials

Fan Guard	HDGS (SUS-304 Option)
Fan Stack	FRP
Distribution Box	FRP
Hot Water Basin	FRP
Eliminators	HDGS
Cooling Coils	Copper (SUS-304 Option)
Inlet Louvers	PVC
Filling	PVC
Sump	FRP
Primary Cold Water Outlet Pipe	PVC
Primary Hot Water Inlet Pipe	PVC
Walkway	HDGS (SUS-304 Option)
Side Plate	FRP
Fan	Aluminum
Ladder	HDGS (SUS-304 Option)
Expansion Tank	FRP
Motor Supporters	HDGS (SUS-304 Option)



Piping Layout



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