

TCY KATALOG



***Low Energy and Water Consumption***  
***Easy Montage***

Freva is a Member of **FORM** Group of Companies



## **ABOUT US**

FORM Freva Soğutma Sistemleri A.Ş. with its dynamic engineering and manufacturing team based on more than 20 years of knowledge and experience, provides design, manufacturing and turnkey installation services of process water cooling equipment for the comfort and industrial sector.

The devices subject to activity are open and closed type cooling towers, hybrid type (which can operate as semi-wet-semi-dry) cooling towers, dry and adiabatic coolers, evaporative and adiabatic condensers and industrial type fin fan dry type coolers. Especially in today's conditions where energy and water resources are of great importance, our experienced engineer staff aims to support businesses in the process of deciding on the most suitable device for the future by making the necessary feasibility studies through our state-of-the-art product selection programs in order to minimize both energy and water costs in line with the demands of the sector.

## **MISSION**

As FORM Freva Soğutma Sistemleri A.Ş., our mission is to establish a company that continuously develops itself with its dynamic and experienced engineer and manufacturing team, aims at maximum customer satisfaction, has environmental awareness, and pioneers design, project and production services for the expectations of all sectors.

## **VISION**

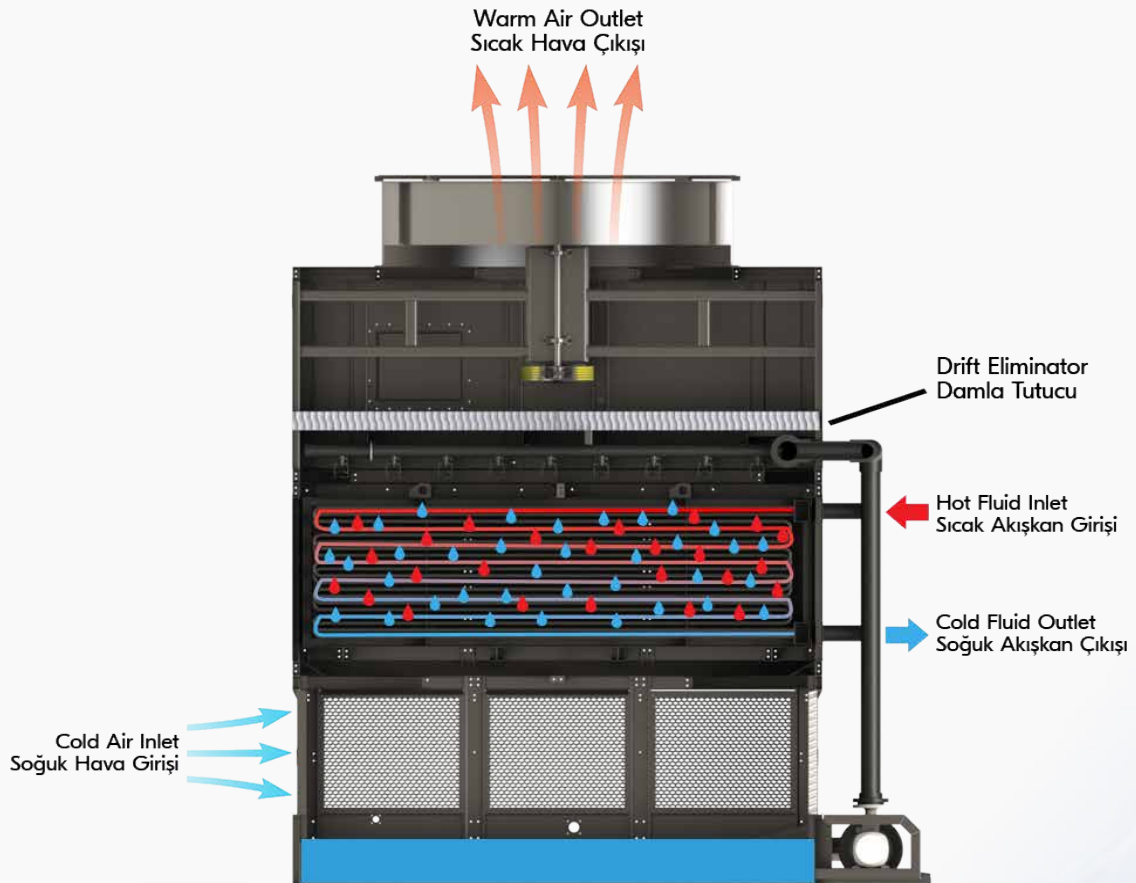
As a result of our R&D activities that we will carry out continuously, to be the leading brand that offers the latest technological products for the needs of the sector and is preferred.

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## FREVA TCY Series Closed Circuit Cooling Towers

The fluid to be cooled enters from the upper collector of the heat exchangers inside the Freva TCY series cooling tower via pumps and circulates in the heat exchanger pipes. Water is sprayed from the water distribution system on to the heat exchangers. In this way, the heat of the fluid circulating in the pipes, which is desired to be cooled, is transferred to the water. At the same time, fresh air is drawn in with the help of fans from the louvers located on the basin part of the cooling tower. The air flow is upwards, with the water flow against the direction. The air drawn from the louvers to the cooling tower moves up along the heat exchanger and is thrown from the tower to the atmosphere through the fan chimneys from the top of the tower. A small part of the water sprayed on the serpentine evaporates in this process. In this way, the heat that is desired to be removed from the system is discarded. The cooled fluid is sent back to the system from the collector located at the bottom of the heat exchanger.



## Advantages of the TCY Series Closed Circuit Counterflow Cooling Towers

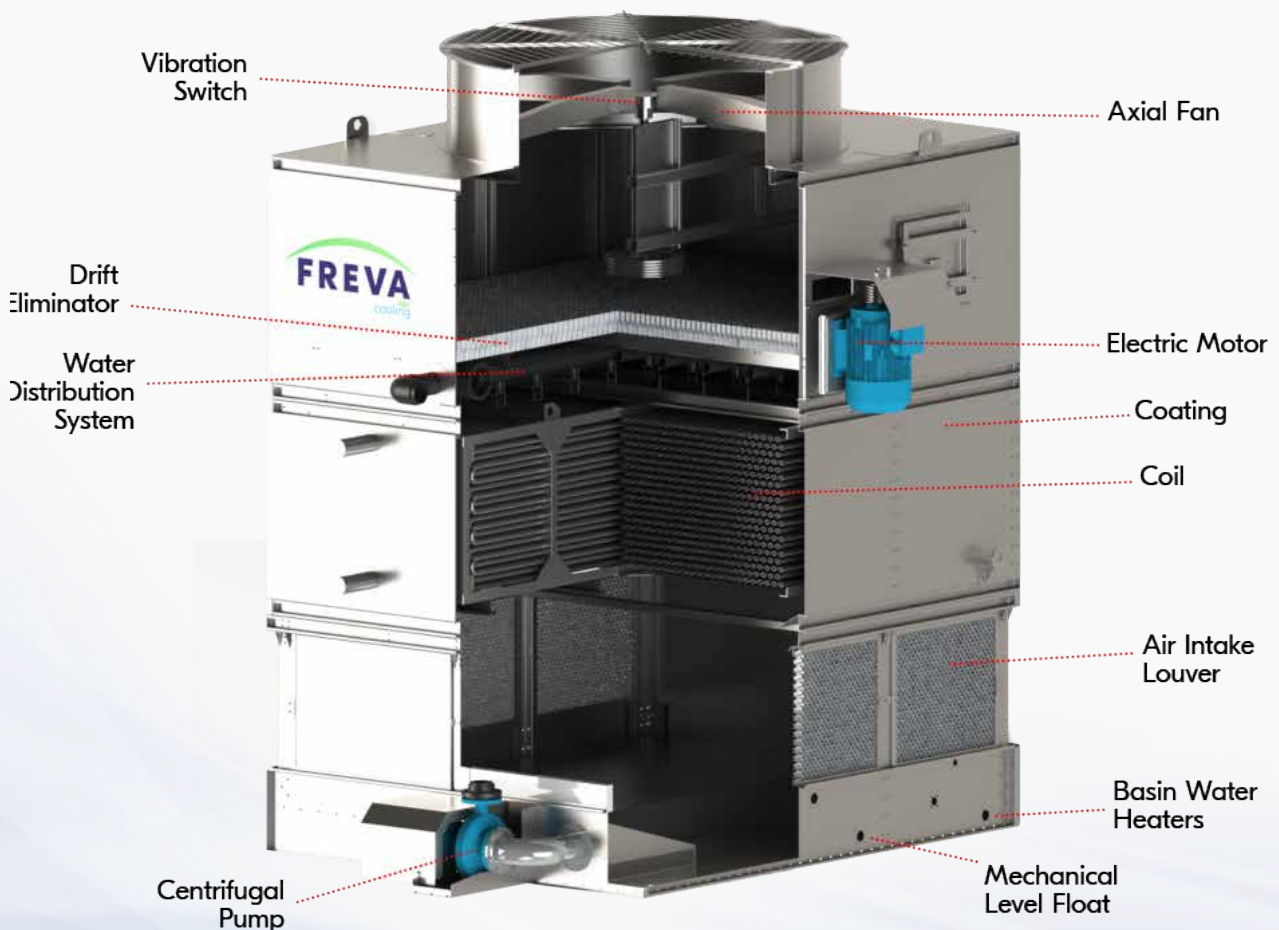


- Cleaner process fluid
- Cleaner interior surface area
- Higher efficiency
- "Dry cooling" mode in winter time to save energy consumption
- Maintaining a clean and reliable system cycle.
- Keeping the system circulated water clean.
- Ease of maintenance, operation and commissioning.
- Reduced water treatment costs for evaporative equipment
- Reduced system maintenance costs
- Initial investment cost return due to reduced system maintenance costs and reduced water treatment costs for evaporative equipment, although initial investment costs are higher than for open loop cooling towers.

### Information About Tower Models

TCY series closed circuit counter flow water cooling towers meet all the demands of its customers with its wide product range. The model range includes tower models with low electricity consumption and high efficiency. It has cooling tower models with low noise levels with its ultra-quiet fan option, and container-sized products that offer comfortable transportation between continents.

### TCY Series Closed Circuit Counterflow Cooling Tower Equipment



## Centrifugal Pump



In all our models, volute, single-stage, end-suction, closed impeller and monoblock centrifugal pumps are used.

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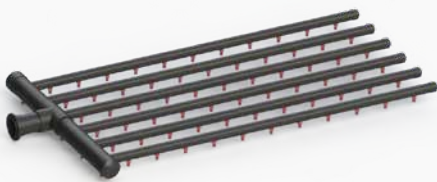
## Coil



TCY series tower coils will be manufactured from high quality steel pipes with hydrostatic test and are subjected to hot dip galvanizing process after manufacturing. At the same time, we have stainless steel applications depending on the request of our customers. The coils are placed horizontally in the tower and are tested with 10 bar compressed air in the test pool.

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## Water Distribution System



It consists of PVC process water distribution pipes and PP sprinkler groups. It is designed to distribute the process water evenly over the entire surface. Developed for high water delivery performance at low pressure. In this way, it provides energy savings in pump lines. It can be easily disassembled and mounted with the threaded connection.

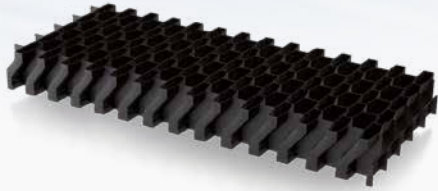
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## Drift Eliminator



The drift eliminator used in the TCY series prevent the process water from leaving the circuit by air, up to 0.02% of the cycle water. This reduces water and chemical consumption. It is very light as it is made of PVC material. In this way, the water distribution system can be easily disassembled in case of maintenance.

## Air Intake Louver



The louvers used in the TCY series allow to keep the water in the cooling tower inside and to keep the external pollution out. The design of the louver has been designed in such a way that it takes the fresh air into the tower in the most efficient way. Thanks to its special form, it minimizes the formation of algae by not letting the sunlight in.

## Axial Fan



Fans in different models and material classes can be used in the TCY series. All fans used are manufactured according to the latest generations of their design classes. Silent, Ultra-quiet options and different material options are available for corrosion resistance.

## Belt Driven Fan System



Belt driven systems are used in applications requiring lower fan speeds. It is generally used in applications with a fan diameter of 1800 mm and larger fan diameters. The system is driven by belts specially designed for the TCY series cooling tower. It provides long life with its multi-channel and high hardness. Belt drive system provides ease of maintenance. It provides low noise level on first take offs.



## Direct Drive Fan System



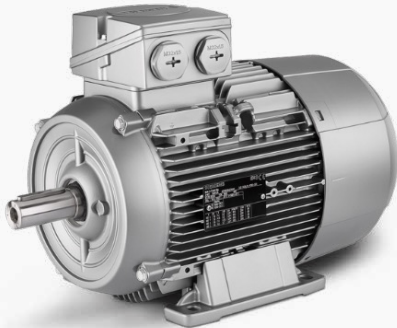
These are the systems in which the fan motors are directly coupled to the fan. It is the drive system applied for low fan diameters. It is easy in terms of maintenance and operation.

## Gear Driven Systems



In gear driven motor systems, the motor and gearbox are on the same axis. Power transmission is provided by gears. The main component of the gearbox is gears, and the engine rotation speed is reduced by these gears.

## Electric Motor



An electric motor is a device that converts electrical energy into mechanical energy. Electric motors generate force by the interaction between the magnetic field and the winding current and are positioned above the carrier base. The motors used in closed-loop water cooling towers have IE3 or higher energy class. The electric motor is the component that creates the fan torque. The torque of the motor is transmitted to the fan by belt or gear.

## Coating



The outer body material is generally produced from sheet metal containing 600 grams of zinc per Z600 square meter. The inner and outer surfaces of the sheets are coated with polymer-based epoxy paint. Stainless steel applications are also made according to the customer's request.

### Basin Water Heaters



Required for cooling tower operation in winter conditions. The temperature of the basin water is controlled with the help of a temperature transmitter. This prevents the basin water from freezing. Copper and stainless steel materials can be used.

### Mechanical Level Float



The float level valve is used for basin water level control, the float height can be adjusted with the horizontally designed arm. When the liquid level rises, the valve closes, or on the contrary, with the rise in the liquid level, the valve opens and begins to discharge.

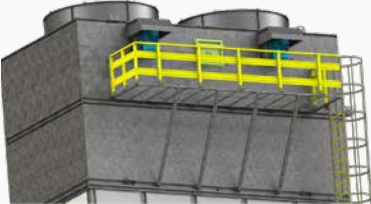
### Vibration Switch



It is located at the top of the tower right next to the fan chimney. It detects the vibration in case of working with vibration in the fan group and ensures that the electric motor is deactivated.

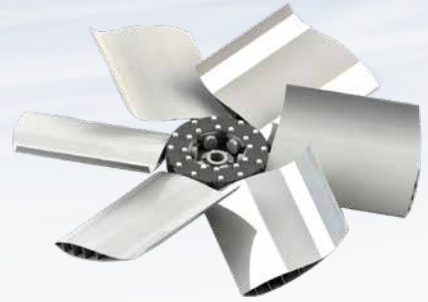
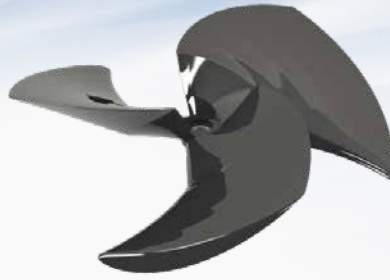
### Our Optional Equipment

#### Maintenance Platform



We have specially designed platforms for the maintenance and repair of cooling towers. It is produced from FRP material as standard. It can also be produced as galvanized steel or stainless on special request.

## Ultra Quiet Fan



Ultra-quiet fans are very quiet compared to expensive and bulky sound-damping equipment. Specially manufactured ultra-quiet fans produce a noise level of 20 db lower than conventional fans. Ultra-quiet fans are manufactured from 710 mm to 10.400 mm.

## Different Color Options



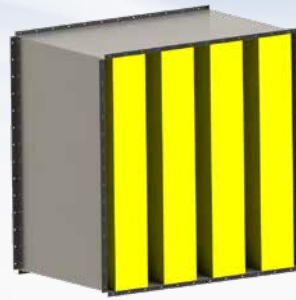
Desired color applications are available according to the needs of our customers. Different color options are offered after our customer specifies the color code they want.

## Basin Sweeping System



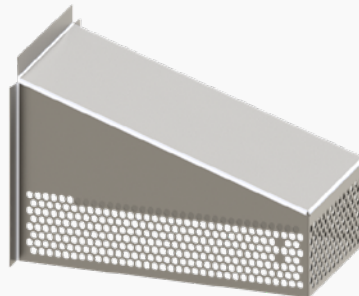
Thanks to our specially designed sweeping system installed in the tower basin, continuous water circulation is provided on the basin floor. In this way, the formation of sediment on the bottom of the tower basin is prevented, and the tower basin remains clean at all times. By preventing tower performance degradation, your tower will always remain clean.

## Silencer



Desired sound level values are provided with special silencers designed to provide the desired sound levels in cooling towers.

## Antivortexhood



If the pump is not supplied with enough water, it will run dry. As a result, unhealthy operation and malfunctions are inevitable. The main purpose of Antivortexhood is to protect the circulation pump against dry running and cavitation.

## MCC and DDC Electrical Panel and Automation Systems



The water cooling tower automation panel provides the operation of the Fan, Pump and Electric heaters on the tower. For the operation of these equipments, motor driver screens, buttons and signal lamps located on the panel lining sheet are used. The first fan drive is called the Master in the system. The entire control scenario runs through this driver. Tower outlet water temperature sensor PT100 is connected. Depending on the temperature, it operates both itself and other drivers with PI control. It also provides output to the pump motor during its operation. It performs the start and stop operations with the signal to be received from the vibration switches. The panel provides power output to the electric heater and this output is switched on and off with buttons. The electric heater performs its operation depending on its own thermostat.

## Electronic Water Level Control



It is designed to control the pool water level electromechanically. Unaffected by variable environmental conditions, the water level in the basin is measured magnetically and brought to the desired level with a solenoid valve. The mains pressure should be at most 10 bar. Electronic equipment is also available for overflow or low water level alarms. In this way, the operation of the cooling tower is facilitated and the basin water level can be monitored from the central systems.

## Filtration System



The water cooling tower filtration system filters the particles in the water cooled in the cooling tower and removes them from the cooling tower. In this way, the performance of the cooling tower will be increased. The risk of corrosion is reduced. It will provide low energy and chemical consumption.



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