

# **THERFLOW**

## **TFC - SERIES CROSS FLOW**

### **CLOSED CIRCUIT COOLING TOWER**



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## WHAT IS TFC



### Cross Flow Closed Cooling Tower

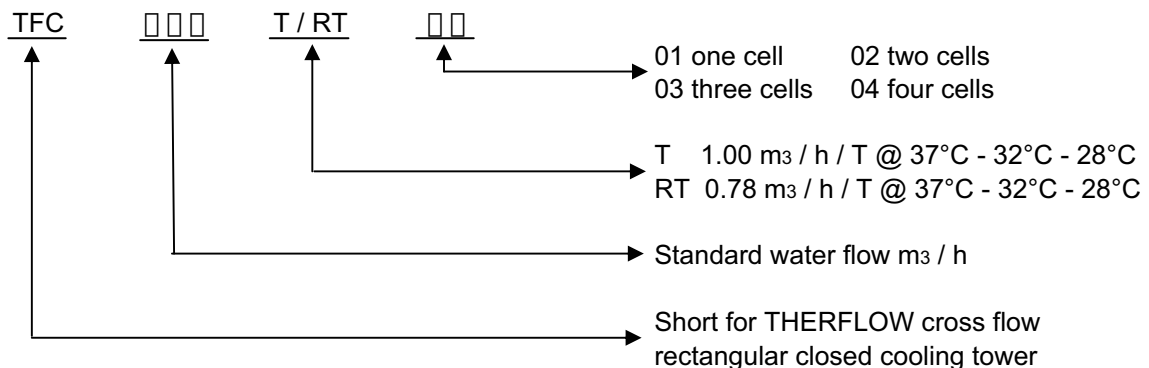


- ▶ TFC cross flow series cooling tower is designed to follow the development of TFW cross flow series open type cooling tower.
- ▶ Block designed heat exchanger (cooper coil parts) installed on grooves opened at the bottom of fill. This kind of design ensures that the TFC has advantages such, as lower gravity center, compact construction, good stability, lower loss of pressure, higher heat exchange efficiency on unit area and convenience on release of air and water.
- ▶ TFC series has been tested by National Quality Testing Center for F.R.P. Products and every item tested accords with requirements of O/LL 002 - 2008 standard (TFC Closed Type Cooling Tower). At the same time TFC series also has passed the CTI test successfully and complies with CTI standard for Thermal Performance.
- ▶ TFC series technology has been awarded several patents.
- ▶ Factory assembled TFC series cooling tower have passed strict testing procedures. It guarantees that the TFC series is with high integrated capacity, can work with high quality and reliability under all operating conditions.

## WHY CHOOSE TFC

- ▶ Stable structural mainframe for protection in the harshest high wind environments.
- ▶ Easy to access and sweep.
- ▶ Corrosion-free, leak free service.
- ▶ Short lead time.
- ▶ Holistic cold water basin and no water splash.
- ▶ Quick installation. Quite operation and low maintenance costs.
- ▶ Cross flow advantages.
- ▶ Simple product selection.
- ▶ TFC Series has passed technical achievement evaluation and proved to be advanced in the world market.

## INSTRUCTION MODEL



## **TFC CROSS FLOW CLOSED COOLING TOWER**



### **TFC Series Line of CTI Certified Closed Circuit Cooling towers**

**CTI Certified Closed Validation Number 09 - 28 -02**

**Standard Fan  
for Markets with  
100m<sup>3</sup>/h/T at 37°C-32°C-28°C**

**TFC-60T  
TFC-70T  
TFC-80T  
TFC-90T  
TFC-100T**

**Standard Fan  
for Markets with  
100m<sup>3</sup>/h/RT at 37°C-32°C-28°C**

**TFC-90RT  
TFC-100RT  
TFC-120RT  
TFC-135RT  
TFC-150RT**

#### Footnotes:

- 1.-Certification includes suffixes -B, -E, -S are added to basic model to indicate the tower construction materials.
  - B** FRP casing, FRP basin, and HDG mainframe and hardware.
  - E** FRP casing, FRP basin, and stainless steel mainframe and hardware.
  - S** Stainless Steel casing, basin, and mainframe and hardware.
- 2.-The basic model numbers above are for 50hz fan motor and suffixes /F is added for 60hz motor application.
  - Ex. TFC-100T-B is for 50hz motor, TFC-100T-B/F is for 60hz motor.
- 3.-Certification includes use of side, end or bottom water inlet configuration.
- 4.-Certification includes units with optional gear drive in place of standard belt drive.
- 5.-Certification includes use of optional handrail and/or ladder cage.
- 6.-Multiple cell models of the single cell models above are also available but not listed.

# TFC SELECTION CHART

## COOLING TOWER SELECTION

### 1. DESIGN CONDITION

- HOT WATER TEMP. : 37 °C
- COLD WATER TEMP. : 32 °C
- WET BULB TEMP. : 28 °C
- WATER FLOW : 100 m<sup>3</sup>/hr
- RANGE ( HWT-CWT ) = 37-32=5 °C

### 2. FIND CROSS POINT - A

- CROSS POINT HOT WATER TEMP LINE AND WET BULB TEMP.

### 3. FIND CROSS POINT -B

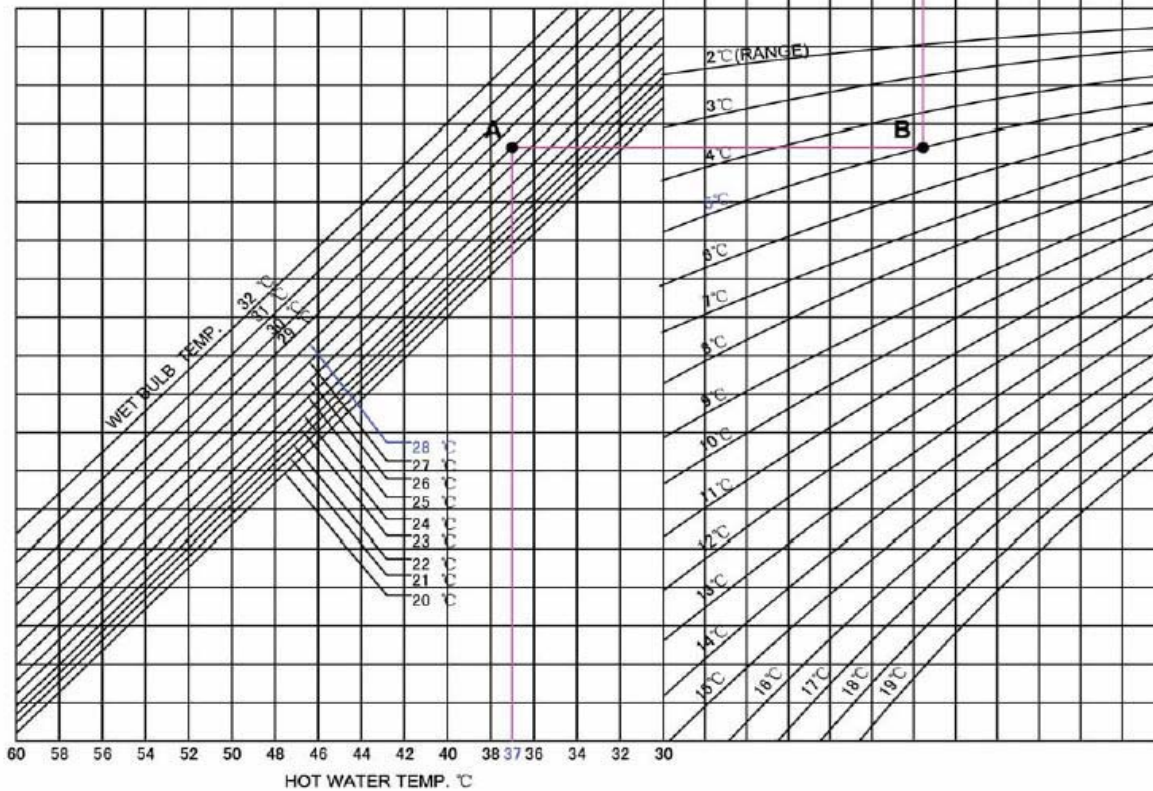
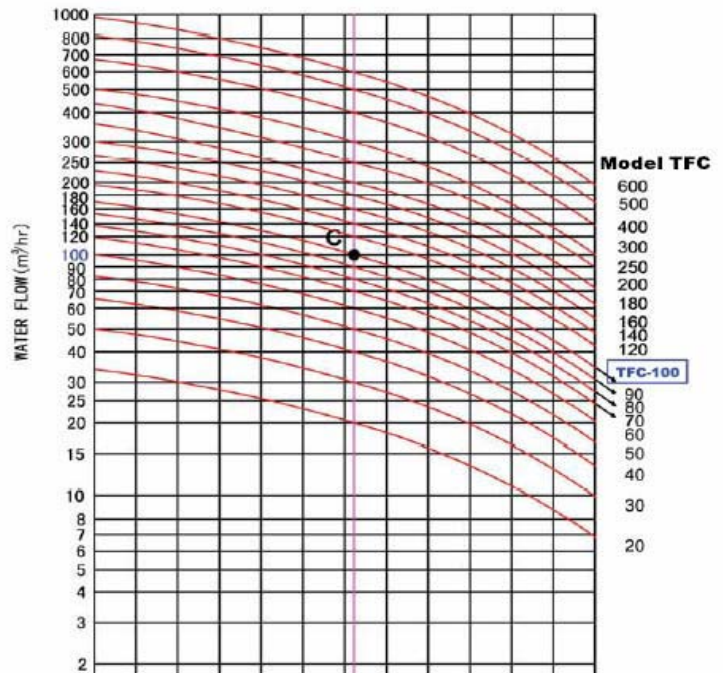
- CROSS POINT A EXPENDED LINE AND RANGE ( 5 °C ) LINE

### 4. FIND CROSS POINT -C

- CROSS POINT B EXPENDED LINE AND WATER FLOW ( 100 m<sup>3</sup>/hr ) LINE

### 5. FIND SELECTION MODEL

- CROSS POINT C EXPENDED LINE - **TFC-100**



## EASY ACCESIBLE DRIVING SYSTEM

- ▶ TFC motors are located on the outside of the unit. Compared with the motor inside the fan section, it is easier to remove and repair. Outside installed motors are not affected with the mist. Quiet operation is achieved through careful design and quality controlled manufacturing methods of components. Test results prove that our sound levels are the lowest available in the industry.
- ▶ We have several different design of motors to meet customer needs.



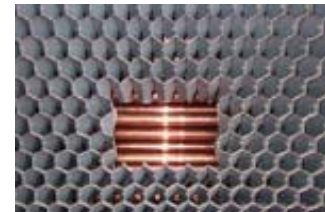
## CTI CERTIFIED COOLING TOWER

- ▶ Cooling Technology Institute ( CTI ) is the most prestigious organization in the inspection of evaporative heat transfer systems and cooling tower thermal performance, with its headquarters located in Houston Texas, USA. CTI supplies test services all over the world for all cooling tower manufacturers seeking CTI certification. CTI certification provides quality assurance of thermal performance, to comply with government regulations and also conformity with customer specifications. Cooling tower models tested and inspected annually ensure certified continuous thermal performance.
- ▶ THERFLOW TFC series closed circuit cooling tower was certified by CTI in 19th Sep. 2008. According to the CTI official website, THERFLOW is one of five manufacturers in the world of closed circuit cooling towers.



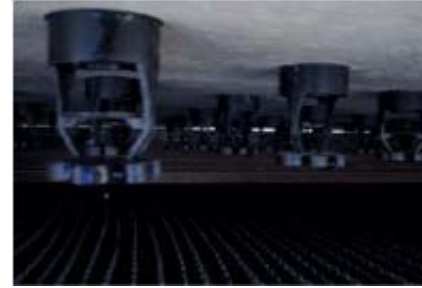
## PATENT DESIGN OF HEAT DISCHARGE MODULE

- ▶ Open grooves at the bottom of TFC open type tower's infill and then inserted in the coil heat exchanger inside the grooves. The sprinkling water is cooled first at the top of the infill and then across the surface of the coil pipe, which will increase the drive force of heat exchanging of the pipe coil and greatly improve the heat discharge efficiency of the units area.
- ▶ The inlet and outlet pipe ends of the pipe coil cells are bell-mounted and nut-shaped. Near to the pipe end is a section of more pipe used to adjust the position of inlet and outlet pipe end. The H-shaped pipe, vertical pipe and U-shaped pipes are among the pipes that connect coil cell. There are metal anchor grooves to fix the vertical pipe certain and predetermined distances. This kind of pipe coil cell is shunt-wound for upper and lower routes and the distance & resistance are also same for each route.
- ▶ This innovative design makes it easy to assembled 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 and sprinkling infill to improve the heat discharge efficiency on unit area. This pipe coil cell design has an utility model patent.



## WATER DISTRIBUTION SYSTEM

- ▶ TFC cooling tower distribution system consists of gravity distribution with large orifice nozzles, which greatly reduce clogging and assure constant performance capacity between maintenance interval. When nozzle cleaning is required, each nozzle can be easily removed in place and cleaned.



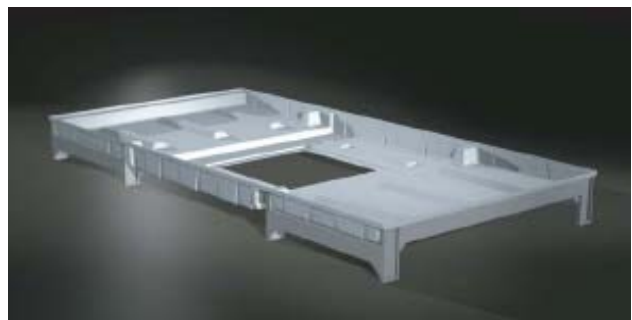
## HIGH EFFICIENT AIR FOIL AXIAL FAN

- ▶ Airfoil-shaped blades are totally fabricated from extrusion Aluminum Alloy. Fan hubs are fabricated with hot-dip galvanized circular plates. The aerodynamic shape together with the lower tip speed ensure a lower noise level. The fan blades are 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, made from FRP materials.



## HIGH EFFICIENT AIR FOIL AXIAL FAN

- ▶ FRP basin and casing are a single piece to guarantee leak free operation and corrosion protection. The basin is leak tested at the factory with a two leak proof guarantee.
- ▶ Casing contains stable material resisting ultraviolet radiation, therefore they have smooth and clean surface, it is able to bear aging, with a high polish lasting through a long time.



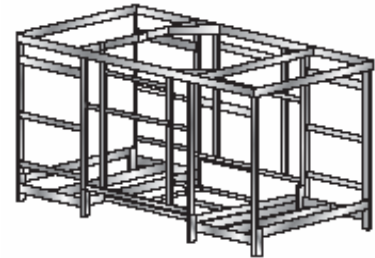
## MECHANICAL PARTS

- ▶ Pulleys have passed dynamic balancing test, that will guarantee its quiet and vibrationless operation.
- ▶ TFC cooling tower's grease lubricator can provide the grease automatically and continuously for the fan shaft bearings. Since it is located outside fanstack, 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 attacks.



## RELIABLE MAINFRAME

- ▶ TFC heavy duty steel structural framework is designed to meet the customer's requirement for bearing the extreme wind and impact circumstance. Compared with existing cooling tower, TFC 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, SUS-304 steel framework is available.



## HIGH EFFICIENT AIR FOIL AXIAL FAN

- ▶ With the increase of thermal performance, TFC series has adopted a velocity recovery fan stack.
- ▶ This application can be used to gain extra capacity in tight layout with same horse power.
- ▶ Fan guards are made in accordance with ANSI safety standards.
- ▶ Larger platforms allow for inspections and maintenance simpler and easier.



## HIGH EFFICIENT SPRINKLING PUMP

- ▶ High-efficiency sprinkling pumps for closed circuit cooling tower to ensure that the TFC tower can be high efficiency low energy consuming as well as achieve 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.



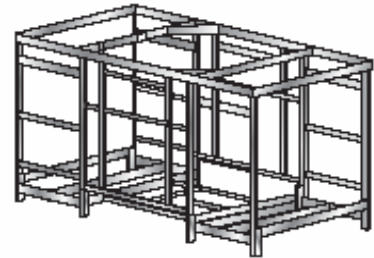
## HIGH EFFICIENT INFILL

- ▶ TFC tower continues to use the patented TFW infill . It is a thermal vacuum formed from anti ultraviolet and anti rust PVC.
- ▶ Good rigidity, low wind resistance & excellent thermal performance.
- ▶ Integrated with eliminator & louver, TFC fills are hung by galvanized steel support bar that passes through the fill.
- ▶ Compact design makes for ease of cleaning and replacement.



## RELIABLE MAINFRAME

- ▶ TFC heavy duty steel structural framework is designed to meet the customer's requirement for bearing the extreme wind and impact circumstance. Compared with existing cooling tower, TFC decrease the parts in quantity by more than 30%. Less frame parts means less labor needed for assembly and maintenance, and also lower cost.
- ▶ For application under extremely corrosive condition, SUS-304 steel framework are available.



## MECHANICAL PARTS PROTECTION

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



## LARGEST WORKING PLATFORM

- ▶ For the convenience of maintenance the TFC has a very large working platform.
- ▶ The platform is located between two access doors, its width and length make it easily accessible for maintenance personnel to check all parts of the tower.
- ▶ The large access door makes it easier for maintenance personnel to go in and out without shutting down the cooling tower.





## TFC PARAMETERS

**Design Conditions:**

Water Inlet Temp.-T1=37°C, Water Outlet Temp.-T2=32°C, Wet bulb Temp.-WB=28°C, Range.-ΔT=5°C, Barom.P=99400Pa

Water Inlet Temp.-T1=99°F, Water Outlet Temp.-T2=90°F, Wet bulb Temp.-WB=82°F, Range.-ΔT=9°C, Barom.P=33.24 Ft w.c

List		Model	Unit	TFC - SERIES							
				60T	70T	80T	90T	100T	120T02	140T02	
<b>DESIGN</b>	Water Flow Rate	gpm	264	308	352	396	440	528	616		
		m3/h	60	70	80	90	100	120	140		
	Heat Load	MBH	1,190	1,389	1,587	1,786	1,984	2,381	2,778		
		kcal/h	300,000	350,000	400,000	450,000	500,000	600,000	700,000		
	Design Conditions	°F	99 (Hot Water) → 90 (Cold water) → 82 ( Wet Bulb temp)								
		°C	37 (Hot Water) → 32 (Cold water) → 28 ( Wet Bulb temp)								
	Pressure Drop	kPa	56	57	70	96	87	56	57		
Pump Power	kW	2.2	2.2	1.5 x 2	1.5 x 2	1.5 x 2	2.2 x 2	2.2 x 2			
<b>SIZE</b>	Length ( L )	inches	165		189			165			
		mm	4200		4800			4200			
	Width ( W )	inches	87		94			110			
		mm	2200		2400			2800			
	Overall Height	inches	141		151			141			
		mm	3575		3825			3575			
	Height	inches	105		120			113			
		mm	2660		3060			2860			
<b>FAN PART</b>	FAN	Diameter	inches	71 x 1		79 x 1			95 x 1		
			mm	1800 x 1		2000 x 1			2400 x 1		
		Air Volume	cfs	438	547	684	820	958	1094	1231	
	m3/h		73000	93000	103000	111600	111600	73000 x 2	93000 x 2		
	Type & Drive Sys.		Axial - Flow & V - Belt								
	MOTOR	Type		Total Enclosed Fan Cooled / 3 Phase / 4 Pole							
		Power Source		3 Phase - 220V / 380V / 440V							
		Rate Output	kW	4 x 1	5.5 x 1	5.5 x 1	7.5 x 1	7.5 x 1	4 x 2	5.5 x 2	
Coil		Copper tubes or Eq.									
Framework		STEEL ( Hot Dip Galvanized )									
Fill / Eliminator / Louver		PVC									
Distribution Panel		FRP									
Cold Water Basin		FRP									
Fan		AL- ALLOY or Eq.									
Casing / Fan stack		FRP									
Nozzle		P.P.									
<b>PIPING</b>	Water Inlet	5" x 1		6" x 1			5" x 2				
		125A x 1		150A x 1			125A x 2				
	Water Outlet	5" x 1		6" x 1			5" x 2				
		125A x 1		150A x 1			125A x 2				
	Drain	2" x 1		2" x 1			2" x 2				
		50A x 1		50A x 1			50A x 2				
	Over Flow	2" x 1		2" x 1			2" x 2				
		50A x 1		50A x 1			50A x 2				
	Make - Up ( Auto )	1" x 1		1" x 1			1" x 2				
		25A x 1		25A x 1			25A x 2				
	Make - Up ( Manual )	1" x 1		1" x 1			1" x 2				
		25A x 1		25A x 1			25A x 2				
<b>LOSS</b>	EVAPORATION LOSS	%	0.833								
	DRIFT LOSS	%	< 0.005								
<b>SHIPPING WEIGHT</b>	lb		3322	3476	4752	4928	5192	6644	6952		
	kg		1510	1580	2160	2240	2360	3020	3160		
<b>OPERATING WEIGHT</b>	lb		8910	9350	11220	11660	12100	17820	18700		
	kg		4050	4250	5100	5300	5500	8100	8500		

# TFC PARAMETERS

**Design Conditions:**

Water Inlet Temp.-T187C, Water Outlet Temp.-T282C, Wet bulb Temp.-WB28C, Range.-

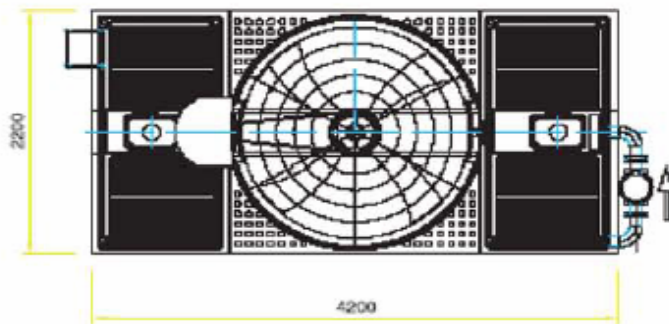
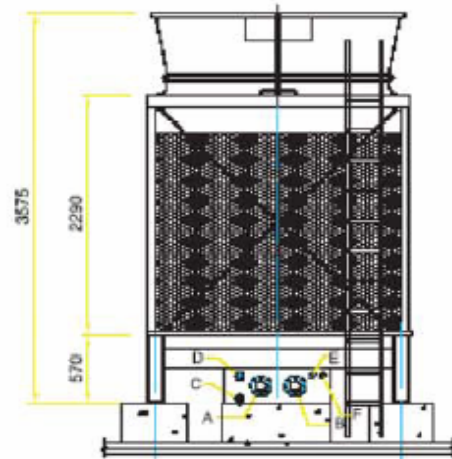
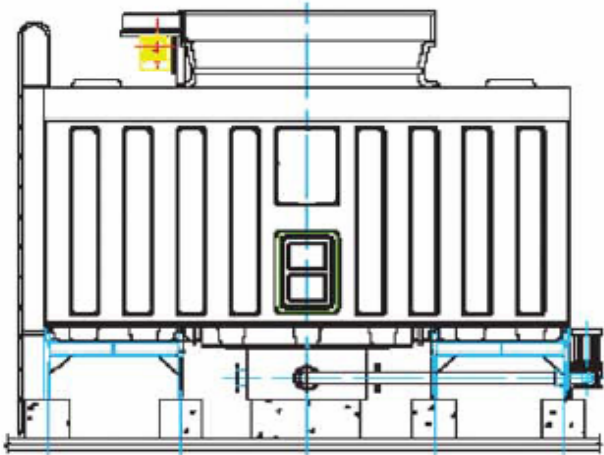
ΔT5C, Barom.P99400Pa

Water Inlet Temp.-T199F, Water Outlet Temp.-T200F, Wet bulb Temp.-WB82F, Range.-

ΔT9C, Barom.P3.24 Ft w.c

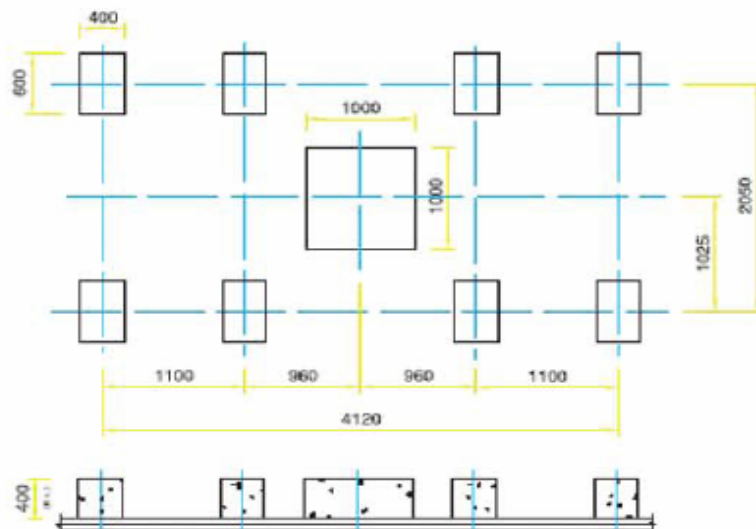
List		Model	Unit	TFC - SERIES						
				160T02	180T02	200T02	210T03	240T03	300T03	
<b>DESIGN</b>	Water Flow Rate	gpm	705	793	881	925	1057	1321		
		m3/h	160	180	200	210	240	300		
	Heat Load	MBH	3,175	3,571	3,968	4,167	4,762	5,952		
		kcal/h	800,000	900,000	1,000,000	1,050,000	1,200,000	1,500,000		
	Design Conditions	°F	99 (Hot Water) → 90 (Cold water) → 82 ( Wet Bulb temp)							
		°C	37 (Hot Water) → 32 (Cold water) → 28 ( Wet Bulb temp)							
	Pressure Drop	kPa	70	96	87	57	70	87		
Pump Power	kW	1.5 x 4	1.5 x 4	1.5 x 4	2.2 x 3	1.5 x 6	1.5 x 6			
<b>SIZE</b>	Length ( L )	inches	189		165	189				
		mm	4800		4200	4800				
	Width ( W )	inches	189		260	283				
		mm	4800		6600	7200				
	Overall Height	inches	151		141	151				
		mm	3825		3575	3825				
Height	inches	120		113	120					
	mm	3060		2860	3060					
<b>FAN PART</b>	FAN	Diameter	inches	79 x 2		71 x 1	79 x 3			
			mm	2000 x 2		1800 x 3	2000 x 3			
		Air Volume	cfm	60588 x 2	65647 x 2	65647 x 2	54706 x 3	60588 x 3	65647 x 3	
	m3/h		103000 x 2	111600	111600	93000	103000 x 3	111600 x 3		
	Type & Drive Sys.		Axial - Flow & V - Belt							
	MOTOR	Type		Total Enclosed Fan Cooled / 3 Phase / 4 Pole						
Power Source		3 Phase - 220V / 380V / 440V								
Rate Output		kW	5.5 x 2	7.5 x 2	7.5 x 2	5.5 x 3	5.5 x 3	7.5 x 3		
Coil		Copper tubes or Eq.								
Framework		STEEL ( Hot Dip Galvanized )								
Fill / Eliminator / Louver		PVC								
Distribution Panel		FRP								
Cold Water Basin		FRP								
Fan		AL- ALLOY or Eq.								
Casing / Fan stack		FRP								
Nozzle		P.P.								
<b>PIPING</b>	Water Inlet	6" x 2		5" x 3	6" x 3					
		150A x 2		125A x 3	150A x 3					
	Water Outlet	6" x 2		5" x 3	6" x 3					
		150A x 2		125A x 3	150A x 3					
	Drain	2" x 2		2" x 3	2" x 3					
		50A x 2		50A x 3	50A x 3					
	Over Flow	2" x 2		2" x 3	2" x 3					
		50A x 2		50A x 3	50A x 3					
	Make - Up ( Auto )	1" x 2		1" x 3	1" x 3					
		25A x 2		25A x 3	25A x 3					
Make - Up ( Manual )	1" x 2		1" x 3	1" x 3						
	25A x 2		25A x 3	25A x 3						
<b>LOSS</b>	EVAPORATION LOSS	%	0.833							
	DRIFT LOSS	%	< 0.005							
SHIPPING WEIGHT	lb	9504	9856	10384	10428	14256	15576			
	kg	4320	4480	4720	4740	6480	7080			
OPERATING WEIGHT	lb	22440	34980	24200	28050	33660	36300			
	kg	10200	15900	11000	12750	15300	16500			

## LAYOUT | FOUNDATION PLAN TFC-60T | TFC-70T



**TFC-60T/TFC-70T PIPE CONNECTION SCHEDULE**

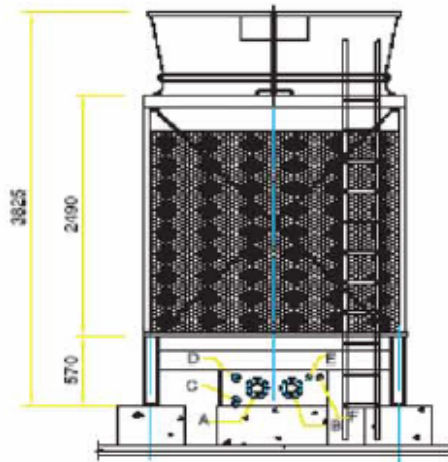
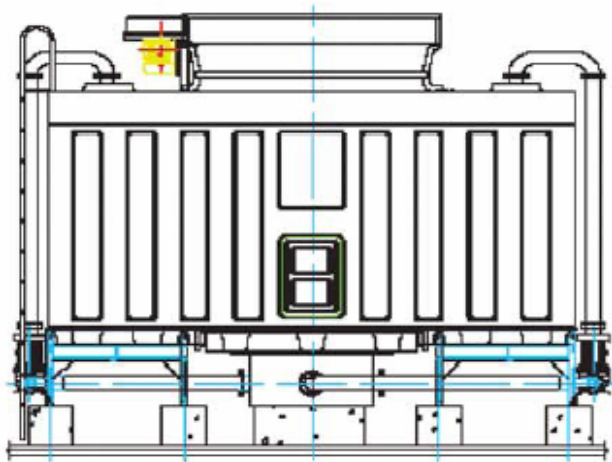
No	NAME	SIZE	CONNECTION
A	INLET PIPE	125A × 1	FLANGE
B	OUTLES PIPE	125A × 1	FLANGE
C	DRAIN PIPE	50A × 1	SCREW THREAD
D	OVERFLOW	50A × 1	SCREW THREAD
E	AUTO MAKE-UP	25A × 1	SCREW THREAD
F	MANUAL MAKE-UP	25A × 1	SCREW THREAD



## TFC-60T / TFC-70T

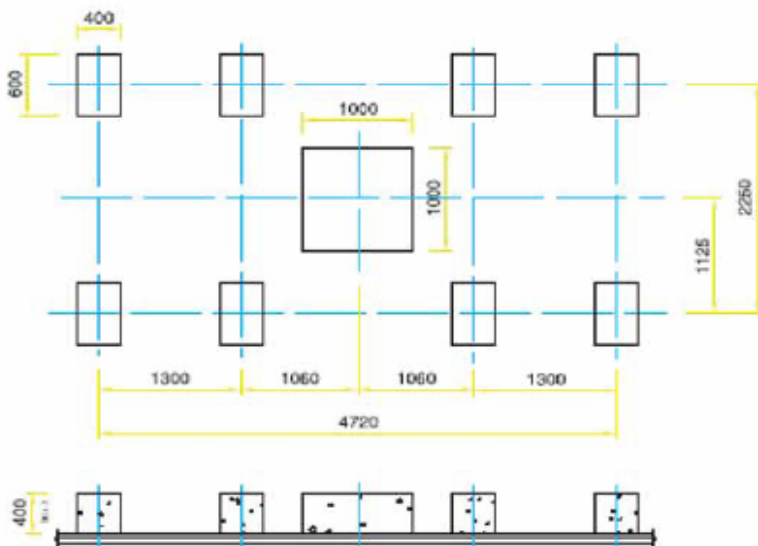
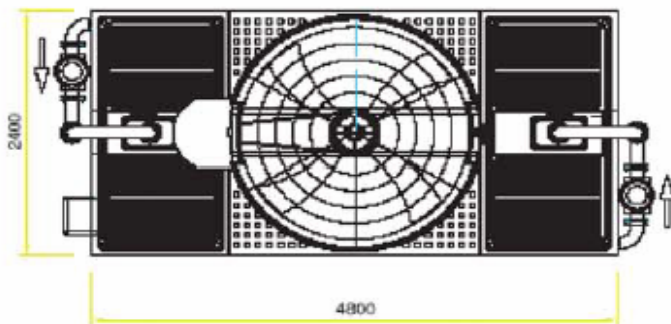
Please not that this information may be changed without notice.

# LAYOUT | FOUNDATION PLAN TFC-80T | TFC-90T | TFC-100T



TFC-80T/TFC-90T/TFC-100T PIPE CONNECTION SCHEDULE

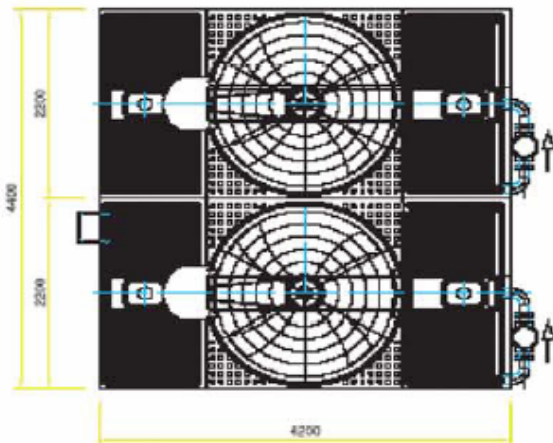
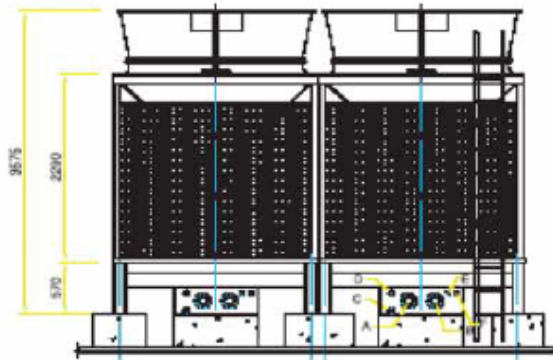
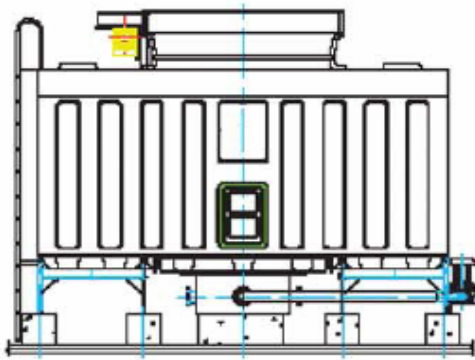
No.	NAME	SIZE	CONNECTION
A	INLET PIPE	150A×1	FLANGE
B	OUTLES PIPE	150A×1	FLANGE
C	DRAIN PIPE	50A×1	SCREW THREAD
D	OVERFLOW	50A×1	SCREW THREAD
E	AUTO MAKE-UP	25A×1	SCREW THREAD
F	MANUAL MAKE-UP	25A×1	SCREW THREAD



## TFC-80T / TFC-90T TFC-100T

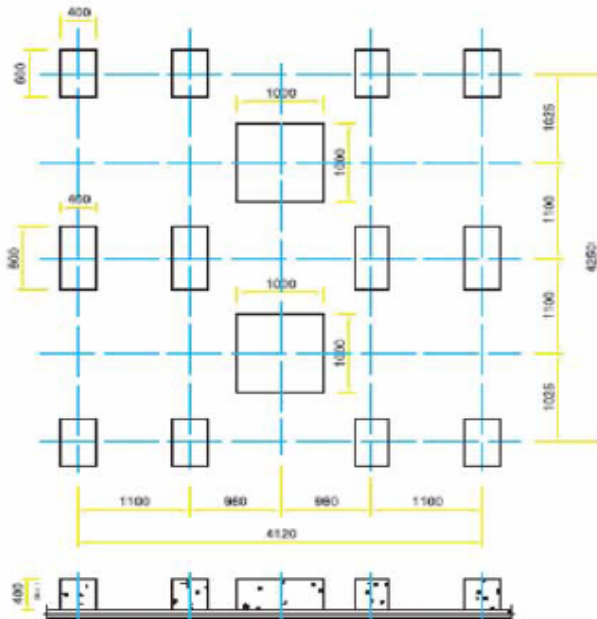
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# LAYOUT / FOUNDATION PLAN TFC-120T02 / TFC-140T02



**TFC-120T02/TFC-140T02 PIPE CONNECTION SCHEDULE**

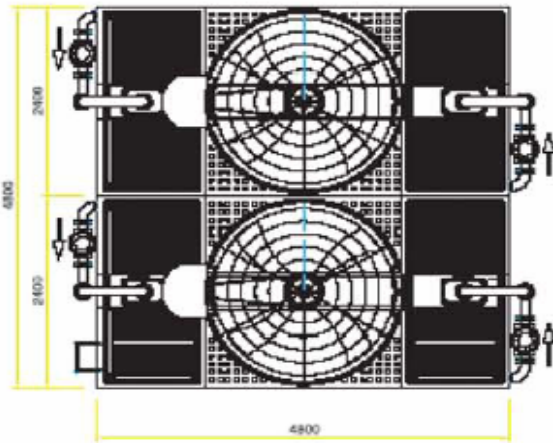
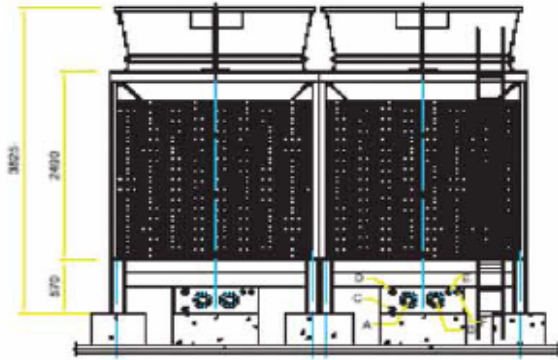
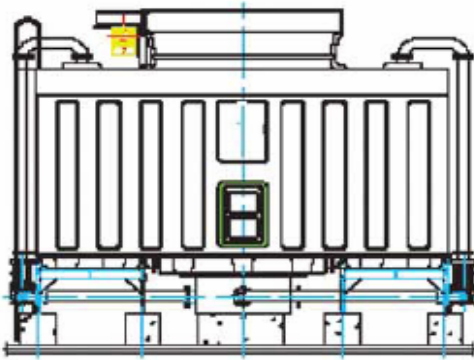
No	NAME	SIZE	CONNECTION
A	INLET PIPE	125A×2	FLANGE
B	OUTLET PIPE	125A×2	FLANGE
C	DRAIN PIPE	50A×2	SCREW THREAD
D	OVERFLOW	50A×2	SCREW THREAD
E	AUTO MAKE-UP	25A×2	SCREW THREAD
F	MANUAL MAKE-UP	25A×2	SCREW THREAD



**TFC-120T02 / TFC-140T02**

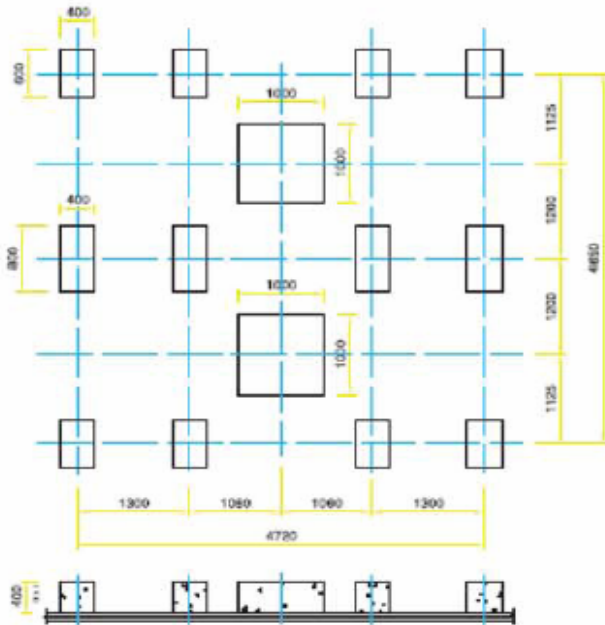
Please note that this information may be changed without notice.

**LAYOUT / FOUNDATION PLAN TFC-160T02 / TFC-180T02 / TFC-200T02**



**TFC-160T02 / TFC-180T02 / TFC-200T02  
PIPE CONNECTION SCHEDULE**

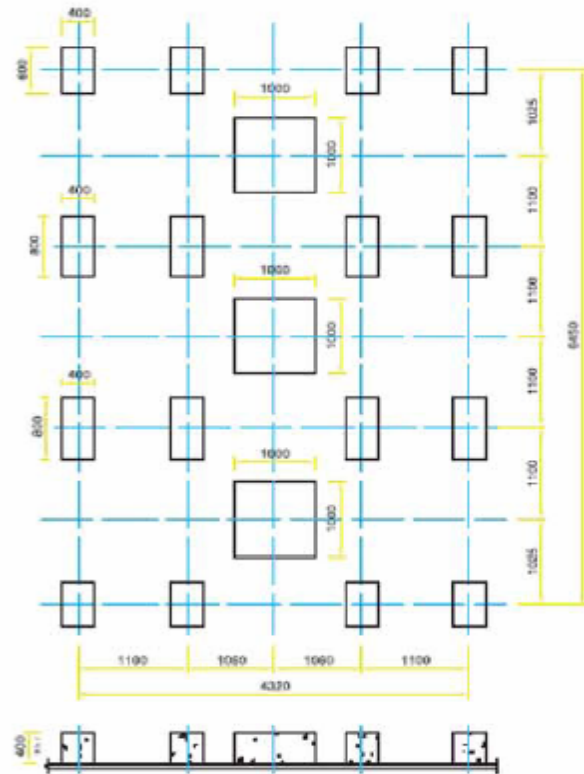
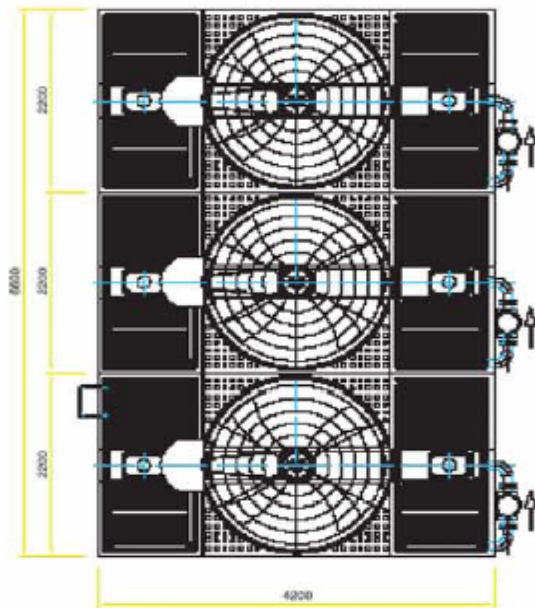
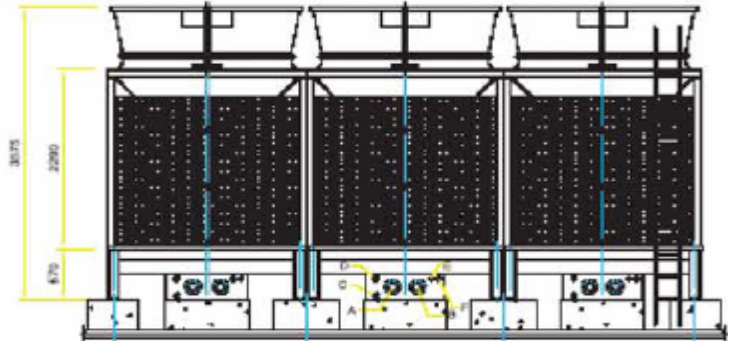
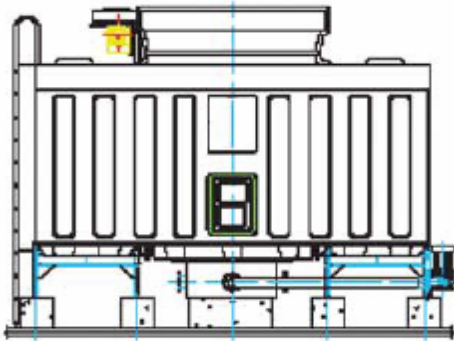
No	NAME	SIZE	CONNECTION
A	INLET PIPE	150A×2	FLANGE
B	OUTLES PIPE	150A×2	FLANGE
C	DRAIN PIPE	50A×2	SCREW THREAD
D	OVERFLOW	50A×2	SCREW THREAD
E	AUTO MAKE-UP	25A×2	SCREW THREAD
F	MANUAL MAKE-UP	25A×2	SCREW THREAD



**TFC-160T02 / TFC-180T02  
TFC-200T02**

Please not that this information may be changed without notice.

# LAYOUT / FOUNDATION PLAN TFC-180T03 / TFC-210T03



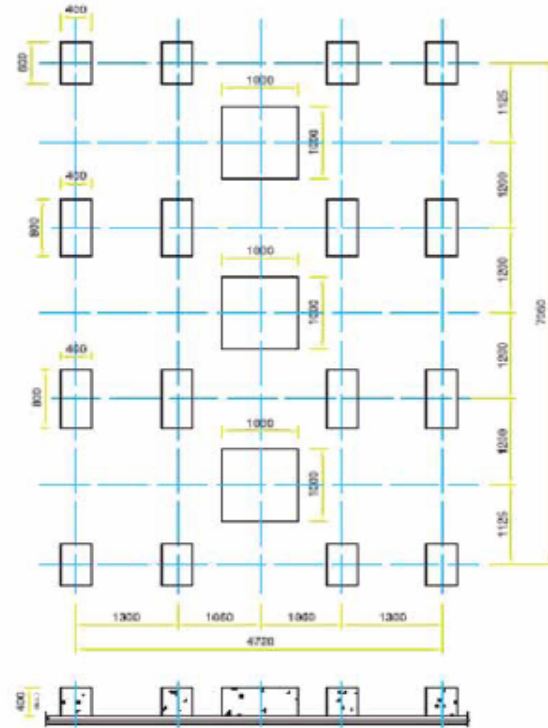
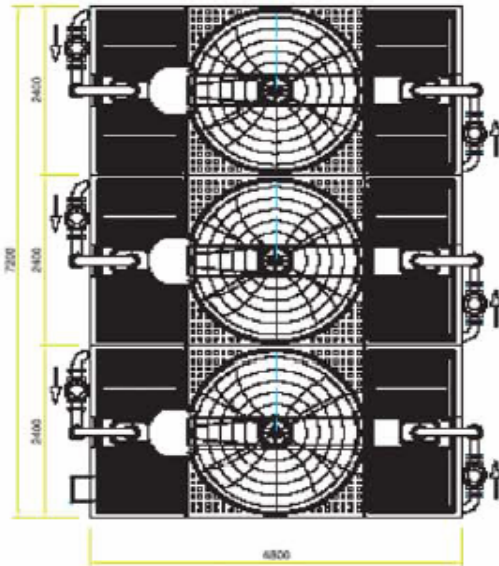
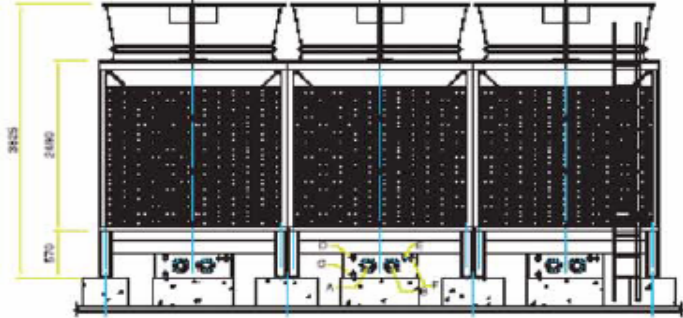
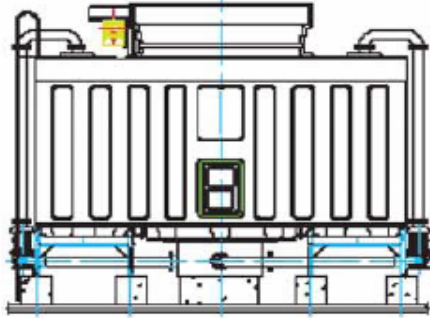
**TFC-180T03/TFC-210T03  
PIPE CONNECTION SCHEDULE**

Nº	NAME	SIZE	CONNECTION
A	INLET PIPE	125A×3	FLANGE
B	OUTLES PIPE	125A×3	FLANGE
C	DRAIN PIPE	50A×3	SCREW THREAD
D	OVERFLOW	50A×3	SCREW THREAD
E	AUTO MAKE-UP	25A×3	SCREW THREAD
F	MANUAL MAKE-UP	25A×3	SCREW THREAD

**TFC-180T03 / TFC-210T03**

Please not that this information may be changed without notice.

**LAYOUT / FOUNDATION PLAN TFC-240T03 | TFC-270T03 | TFC-300T03**



**TFC-240T03/TFC-270T03/TFC-300T03  
PIPE CONNECTION SCHEDULE**

No	NAME	SIZE	CONNECTION
A	INLET PIPE	150A × 3	FLANGE
B	OUTLES PIPE	150A × 3	FLANGE
C	DRAIN PIPE	50A × 3	SCREW THREAD
D	OVERFLOW	50A × 3	SCREW THREAD
E	AUTO MAKE-UP	25A × 3	SCREW THREAD
F	MANUAL MAKE-UP	25A × 3	SCREW THREAD

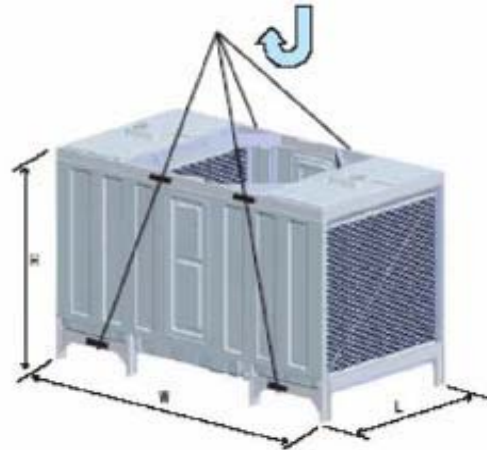
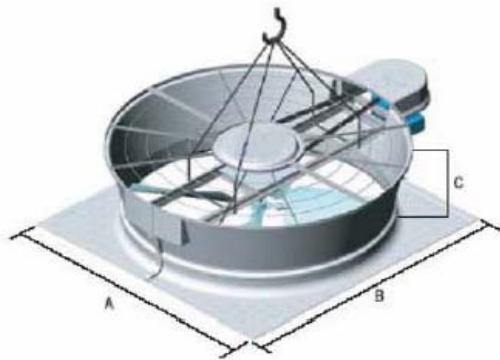
**TFC-240T03 / TFC-270T03  
TFC-300T03**

Please not that this information may be changed without notice.



## THERMAL PERFORMANCE TEST LAB

TFC series could be hoisted in two parts as followings, and after hosting, it will be assembled at site.



- ▶ Hoist Fan Assembly with sling bands connected to the steel reducer frame. When hoisting consider for weight balance and adjust the slings to compensate for the weight of the motor.
- ▶ Seams with silicone & bolt fan assembly to the top steel frame of the cooling tower.

- ▶ Hoist Tower with sling bands connected to the steel frame cross member.

MODEL	TOWER BODY UNIT					FAN ASSEMBLY				
	W	L	H	Max Weight (kg)	Qty	A	B	C	Max Weight (kg)	Qty
TFC										
60T	4200	2200	3575	1500	1	2200	2200	720	300	1
70T										
80T	4800	2400	3825	2300	1	2400	2400	765	450	1
90T										
100T										
120T02	4200	2200	3575	1500	2	2200	2200	720	300	2
140T02										
160T02	4800	2400	3825	2300	2	2400	2400	765	450	2
180T02										
200T02										
210T03	4200	2200	3575	1500	3	2200	2200	720	300	3
240T03	4800	2400	3825	2300	3	2400	2400	765	450	3
300T03										

### NOTICE POINTS 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 measure) when transport, hook up, install, operate, maintain and repair cooling towers.
- ▶ Be sure to read the operation and maintenance manual before operating the towers.
- ▶ Do not enter cooling tower or climb onto the top during operation.
- ▶ For tower maintenance, turn off all power. Install lock out at breaker and display safety sign.
- ▶ In cold climates energize the electric heater to avoid freezing. When tower is not in use drain the water from the basins.

## THERMAL PERFORMANCE TEST LAB

- ▶ Through a continual program of expansion and improvement, the factory established the new cooling tower thermal performance test lab. It is a part of 2005 CTI STD201 Thermal Performance Certification program, in compliance with CTI ATC-105 test standards.
- ▶ 1,500,000 Kcal/hr boiler is installed at the test lab, to test and certify with Inlet Temp 37°C, Outlet Temp 32°C, Wet Bulb Temp 38°C.



## PRODUCT RESEARCH & DEVELOPMENT

- ▶ As an international cooling system supplier, the **THERFLOW** cooling tower factory has its own R & D Center, established in 2004. This center includes cooling tower self-testing system and equipments, computer simulation.
- ▶ In addition to thermal testing, engineers and technicians at the factory continuously focus on the quality and durability of all components that go into **THERFLOW** products. Accelerated life testing of materials, stress measurement and fatigue testing of fans and performance qualifications of pumps and motors are all performed in specialized test equipment in factory R & D Center. These on-going research programs assure that only equipment of the highest quality is consistently delivered to the customers.



## LOW NOISE OPERATION

- ▶ Carefully selected TFC series mechanical parts guarantee optimum thermal performance with minimal sound level.
- ▶ The low sound level generated by TFC series make them suitable for installation in almost environmental concern.
- ▶ For very sound sensitive environment, TFC series service various sound isolating solution. Super low noise fan and stack extension option significantly reduce sound levels generated from the tower with minimal thermal performance losses.
- ▶ Super low noise fan.
- ▶ Stack extension.
- ▶ THERFLOW factory proved attenuator.



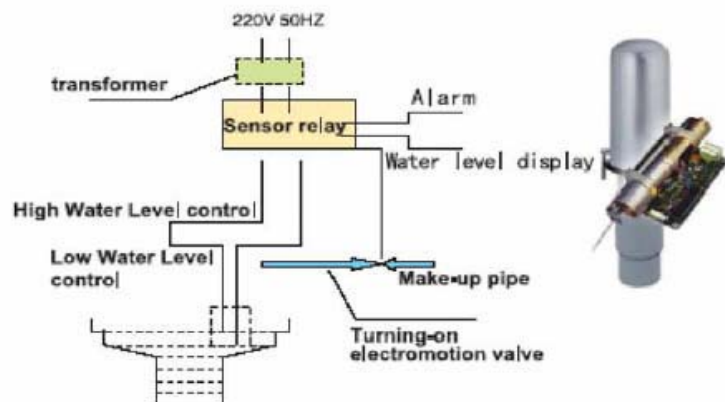
## LADDER, SAFETY CAGE, EXTERNAL SERVICE PLATFORM AND HANDRAILS

- ▶ TFC series provides protection while on top of the cooling tower inspecting or working on the mechanical equipment. Providing a convenient platform to perform work, heavy duty galvanized steel component are used.
- ▶ This option are shipped pre-fabricated for assembly in the field and all access to the top of the equipment must be made in accordance with applicable governmental occupational safety standards.



## AUTOMATIC WATER LEVEL CONTROL SYSTEM

- ▶ Automatic make-up system can adjust water level.
- ▶ Long-term continuous water level demonstration function can be connected with BMS and be monitored..
- ▶ When exceeding 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 it is economical.
- ▶ It can efficiently monitor the water level of the cooling tower and prevent the water level inside the cooling tower being too low. overflow.



## VIBRATION ISOLATOR

- ▶ Carefully selected TFC series mechanical parts guarantee optimum thermal performance with minimal sound level.
- ▶ The low sound level generated by TFC series makes it suitable for installation in almost all environmental concerns.
- ▶ For very sound sensitive environments, sound attenuation options are available Super low noise fan and stack extension option will significantly reduce sound levels generated from the tower with minimal thermal performance losses.
- ▶ Super low noise fan.
- ▶ Stack extension.
- ▶ THERFLOW factory proved attenuator.



## BASIN HEATER IN COLD WATER BASIN

- ▶ When operating the cooling tower at low temperature in winter, basin heater in water basin should be added to prevent freezing during tower shutdown.
- ▶ For more detailed instruction, please refer to Basin Heater Operation or contact HVAC/R International directly.



## ANOTHER TFC OPTION

<b>OPTION</b>	<b>APPLICATION</b>
Vibration Limit Switch	To limit damage to tower
Remote sensor water level display	It is used to observe the water level at long distance
High temperature fill	For entering water temperature over than 55°C.
Variable Speed Drive	Energy saving and low noise operation.
Corrosion resistant frame work	Sea water or other harsh weather conditions.
Chemical water treatment unit	Sea water or other harsh weather conditions.
Air inlet debris screen	Prevent debris from enter cooling tower water.