TOWER TECH
SUSTAINABLE EFFICIENCY

Technical Reference Guide

TTCC SERIES COOLING TOWERS

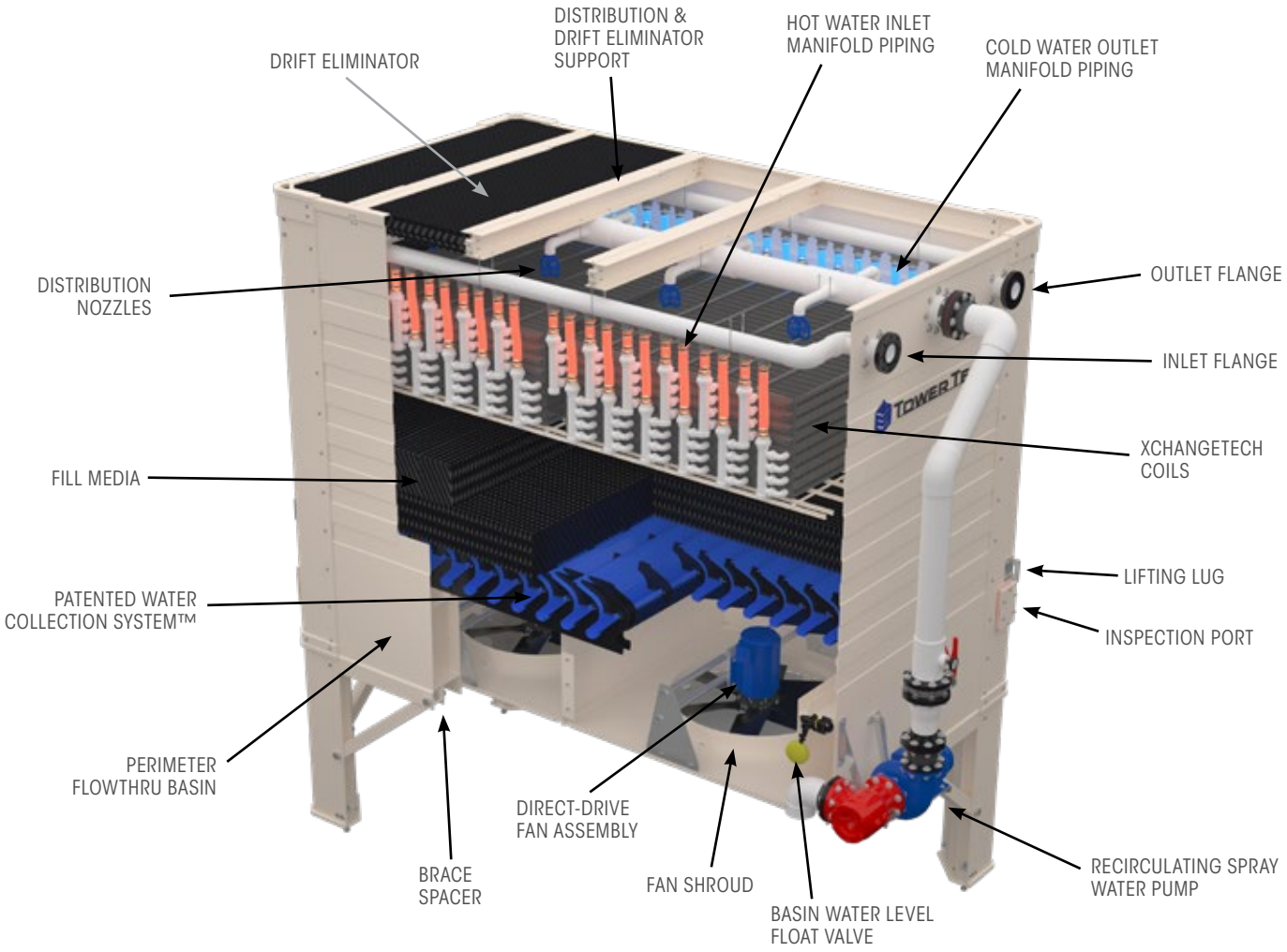
TTCC-HC Hybrid Cooler Series

Factory Assembled Design

The TTCC-HC modular cooling tower is specifically designed for applications requiring a closed-loop system. It optimizes performance for clean process water and adapts to varying ambient conditions. This hybrid fluid cooler reduces energy consumption, maintenance needs, water usage, and installation costs, all while enhancing system reliability. It is an excellent choice for critical operations that need redundancy or where water is a valuable resource. The TTCC-HC operates using a heat exchanger coil to cool the process fluid in hot and humid conditions, while a dry coil cools the process fluid using ambient air in cooler and drier conditions. This model can function in either wet or dry mode, helping to save water and energy throughout the year.

DESIGN FEATURES INCLUDE:

- Fully Enclosed FlowThru™ Basin
- Variable-Flow Rotary Spray Nozzle
- Water Collection System
- Bottom Mounted Fans
- Factory Assembled Modular Design
- Completely Non-Corrosive Materials
- 15-Year Limited Warranty
- Factory-installed smart control package connectable to any building management system



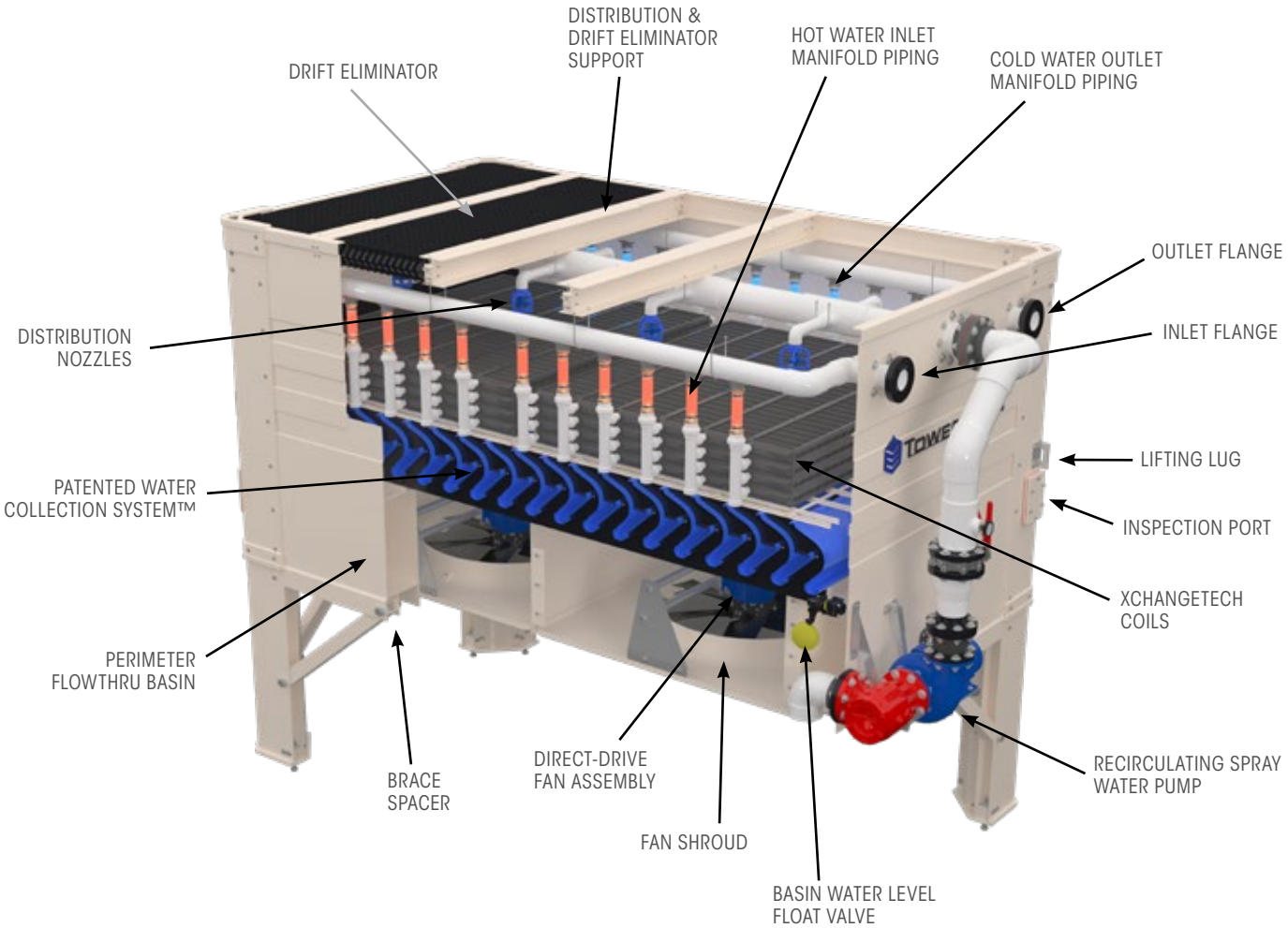
TTCC-FC Fluid Cooler Series

Factory Assembled Design

The TTCC-FC modular cooling tower is specifically designed for closed-loop systems that use clean water or fluids, even in varying ambient conditions. The evaporative fluid cooler's design helps reduce energy consumption, maintenance, and installation costs while improving overall system reliability. This cooling tower is especially suitable for critical operations where redundancy is important or when water conservation is a priority. The TTCC-FC features a heat exchanger coil that efficiently cools the process fluid under fluctuating ambient conditions. Its closed-circuit design keeps the system free from contaminants and requires significantly less water and chemicals.

DESIGN FEATURES INCLUDE:

- Fully Enclosed FlowThru Basin
- Variable-Flow Rotary Spray Nozzle
- Water Collection System
- Bottom Mounted Fans
- Factory Assembled Modular Design
- Completely Non-Corrosive Materials
- 15-Year Limited Warranty
- Factory-installed smart control package connectable to any building management system



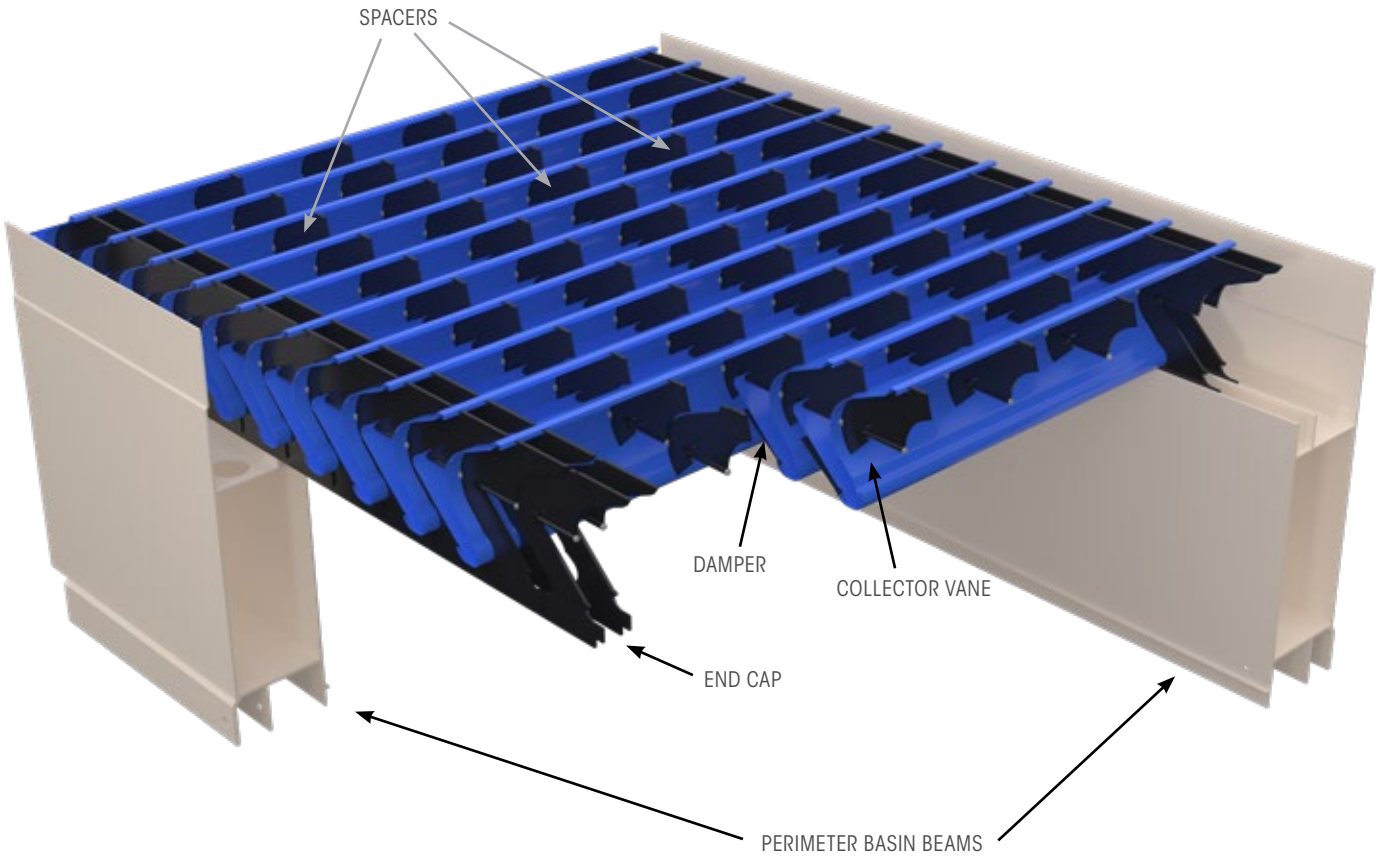
Features

"Tower Tech's modular design enables easy interconnectability to create virtually any size cooling tower and quickly accommodates future expansion of cooling tower capacity."

Like all Tower Tech models, the TTCC models prioritize increased performance at design conditions and have a smaller footprint with less water, energy and chemical use. The versatile modules can be interconnected in nearly any configuration to create virtually any size cooling capacity and easily accommodate future expansion. The performance enhancements of the TTCC design optimize the water distribution system by dispersing smaller water droplets for increased surface area. The forced-draft, counterflow TTCC design is available in two models: Evaporative Fluid Cooler (TTCC-FC) and Hybrid Fluid Cooler (TTCC-HC), which can operate in dry mode.

Water Collection System

TTCC's patented Water Collection System serves as an efficient collection chamber and conduit for channeling water flow into the tower's FlowThru Basin. Its unique shape aerodynamically moves inlet air into the fill media while effectively providing a leak-free barrier protecting cooling tower mechanicals. The water collection system allows for the motors to be placed underneath the fluid cooler out of the wetted airstream and protected from the weather. The fans blow dry cool air across the motors further increasing their longevity.



TTCC Variable-Flow Rotary Spray Nozzle

The TTCC Series towers contain Spin-Free spray nozzles that delivers even fill coverage across a broad range of system flows. The Spin-Free spray nozzle can perform from 25 GPM to 75 GPM. Spin-Free spray nozzles provide a 3-1 turn down from the maximum allowed flow rate. The nozzle requires less pressure to operate than a conventional nozzle, is virtually maintenance free and dramatically improves tower performance. Debris that typically clogs conventional nozzles will pass directly through the spray nozzle. This is accomplished by the 2" (5.08 cm) nozzle throat/inlet coupled with the brisk rotating agitation action provided by the nozzle's turbine.

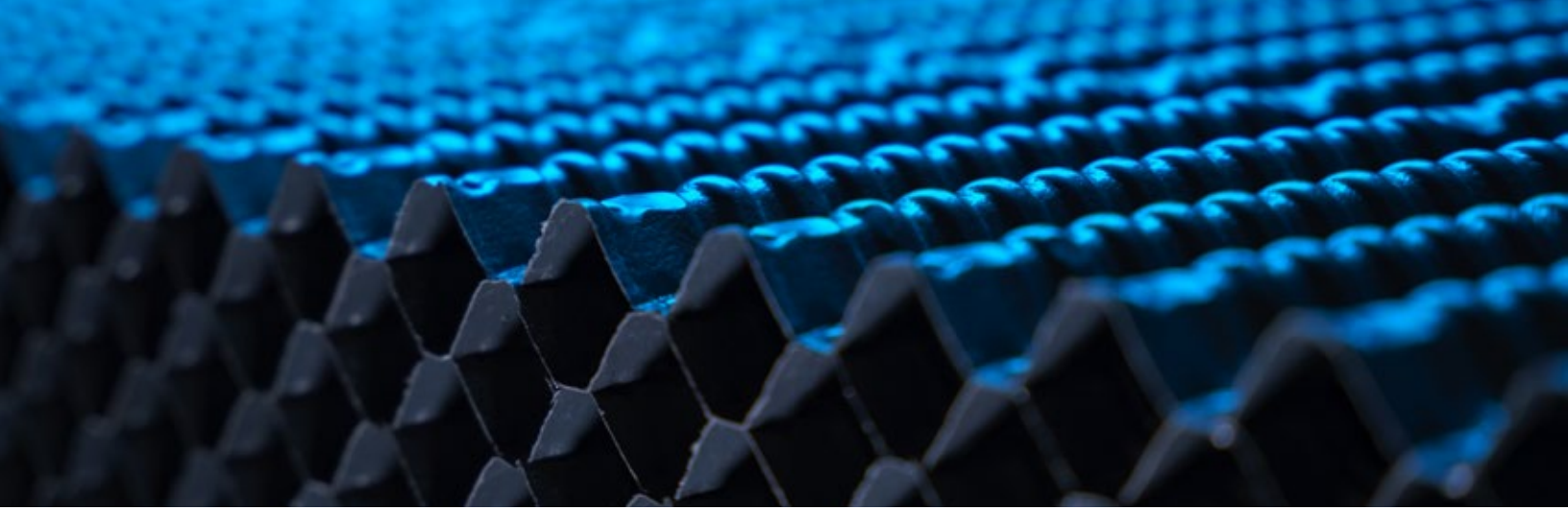
The innovative nozzle design is shaped to provide a square spray pattern, thereby uniformly wetting the entire fill media. This improves tower performance and reduces the likelihood of scaling due to the occurrence of dry regions within the fill. This flexible capability is not present in fixed orifice spray nozzles; they must remain very near design flow to provide the required spray coverage. While conventional towers require a reduction in cell usage when system flow decreases, TTXR Technology permits this varying flow rates to be evenly distributed over all fill media and coils. This results in maximizing cooling capacity and energy efficiency while preventing scale build-up.

XchangeTech™ Coils

Tower Tech created XchangeTech Coils that function equivalently to their metal competitors but without the possibility of corrosion. Hundreds of small-diameter tubes with a thin wall minimize thermal resistance and are bundled together to provide a large primary surface area for heat transfer. They are extremely lightweight, making installation simpler, faster and safer while providing a very low internal pressure drop. Scale does not adhere to the polymer tubes in the exchanger due to the material and vibration caused by airflow moving across the coils; therefore scale inhibitors are normally not necessary, eliminating the cost of chemicals and labor necessary for water treatment. They also have superior impact resistance and are compatible with water, glycols, brine, chlorides, oils and more.

The TTCC-FC is Tower Tech's standard evaporative fluid cooler closed-loop model. The TTCC-FC uses our patented heat exchanger coils to cool the process fluid in fluctuating ambient conditions.

The TTCC-HC is our hybrid model closed-loop tower, specifically engineered to maximize performance for clean process water and operation in fluctuating ambient conditions. The TTCC-HC uses our patented heat exchanger coils to cool the process fluid in fluctuating ambient conditions but can use dry coils to cool with ambient air in cooler, drier conditions, allowing efficient operation year-round.



Fill & Drift Eliminators

Our patented XchangeTech fill media was specifically designed to optimize the performance of the hybrid model closed circuit cooling tower. The fill's efficiency is a function of its ability to promote contact between the air and water with a minimum resistance/ impedance to airflow due to its cross corrugated flute design. The fill used by Tower Tech meets the rigorous standards of the Cooling Technology Institute (STD-136[88]).

Our closed-circuit cooling towers are equipped with low-pressure sinusoidal-wave shaped PVC drift eliminators (15 mil finished thickness). These high efficiency cells (drift loss guaranteed not to exceed 0.0004%) force the exiting airstream to make three distinct directional changes causing exiting moisture droplets to impinge and coalesce on its high surface areas. The low exit velocity combined with lowest drift rate reduce drift and plume while mitigating the threat of spreading legionella. The PVC material used in the construction is virtually impervious to rot or decay. An ultraviolet inhibitor engineered into the product extends the life-expectancy.

Motors/Fans/Shrouds

All current Tower Tech modular cooling towers are equipped with direct-drive motors, totally enclosed air over (TEAO), 6-pole, induction-type, inverter ready, with Class H (Class F minimum) insulation, and L10 sealed bearings rated for 100,000-hour life with sealed case. 60 Hz motors have a nominal RPM of 1200. All motors meet IP55 and NEMA MG-1 Parts 30 and 31 requirements. Motor type and power level depends on tower model selected and required design conditions. The motors do not require any servicing or maintenance such as lubrication of the bearings.

STANDARD AVAILABLE MOTOR TYPES

- 60Hz 40°C - Available in 3.0 HP, 5.0 HP, 7.5 HP or 10 HP
  Available at 200V, 230V, 460V and 575V
- 60Hz 50°C - Available in 3.0 HP (2.2 kW), 5.0 HP (2.9 kW) or 7.5 HP (4.5 kW)
  Available at 180V, 230V, 380V, 415V or 460V
- 50Hz 40°C - Available in 2.2 kW, 3.7 kW, 4.8 kW or 5.6 kW
  Available at 190V-208V, 220V, 380V-415V or 440V
- 50Hz 50°C - Available in 2.9 kW or 4.5 kW
  Available at 190V-208V and 380V-415V

Tower Tech fans use high-efficiency molded thermoplastic blades with a unique airfoil design resulting in uniform airflow and minimal turbulence to maximize system efficiency. Adjustable- pitch blades along with lightweight, high-strength cast aluminum silicon alloy hubs simplify field adjustments. Blade tip tolerances are quality control validated in order to ensure maximum system efficiencies. Tower Tech's stainless steel tubular motor-mount minimizes air turbulence for quiet operation and reduces corrosion for long-life.

The TTCC Series precision molded fan shroud is manufactured from advanced FRP composite material. It is engineered to provide a smooth air entry (optimized r/d) and approach velocity. The heavy-duty FRP shroud is lightweight and will resist corrosion indefinitely.

Materials of Construction

The Tower Tech StormStrong® & FireStrong® cooling tower structure is factory assembled and constructed primarily of structural FRP and stainless-steel hardware, which together provide a rigid shell and framework for the tower that will resist deterioration and corrosion indefinitely. There are no galvanized or wood components which could potentially leak hazardous chemicals into the environment. Walls are joined together by tongue and groove joints and are sealed by a polyurethane sealant to prevent leaks. Stainless steel fasteners employing coated threads (in wetted areas) are used to bolt the walls together and ensure leak-free operation under pressurized operating conditions.

Component	Material
Fill Media	10 mil PVC (std.), 15 mil PVC (opt.)
Drift Eliminators	15 mil PVC (Thermoformed)
Spray Nozzle	HDPE (Injection Molded)
Water Collection System	ABS (Extruded)
Water Distribution Header, Laterals & Coil Connector Fittings	PVC
Header Inlet Flange	PVC (Injection Molded)
Hardware	304 Stainless Steel
Corner Enclosure	FRP (Pultruded)

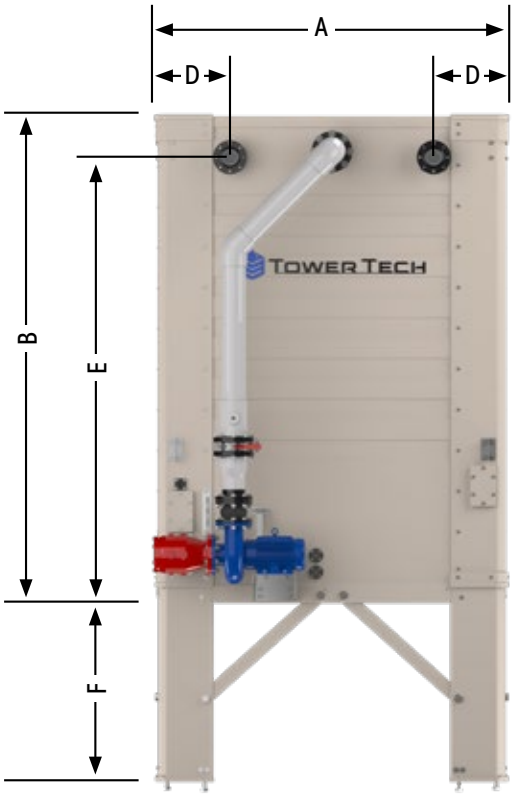
Component	Material
Shell/Casing	FRP (Pultruded)
Sub-Structure Legs	FRP (Pultruded)
Wind Wall Partitions	ABS (Extruded)
Modular Base Support & Footpad	Nylon (Injection Molded)
Fan Shroud	Hand Lay-Up Fiberglass or Resin Transfer Molded Fiberglass (Flame Retardant)
XchangeTech Coils	Nylon/PE
Inspection Ports	Nylon (Injection Molded)
Motor Support	304 Stainless Steel

Key: FRP = Fiberglass Reinforced Plastic Pultrusion
PVC = Poly-Vinyl Chloride (Self-Extinguishing)
ABS = Acrylonitrile, 1,3-Butadiene, and Styrene Copolymer (Flame Retardant)
PE = Polyethylene
HDPE = High Density Polyethylene

TTCC Model	Weight in Lbs. (kg)		Dimensions per Illustration Below[a] (cm)					
	Shipping[b]	Operating	A	B	C	D	E	F
i1xxxx-HC	4,441 (2,015)	5,555 (2,520)	8'-00" (243.8)	11'-00" (335.3)	8'-00" (243.8)	1'-09" (53.3)	10'-3" (312.4)	4'-0" (121.9)
i2xxxx-HC	6,421 (2,913)	8,281 (3,757)	8'-00" (243.8)	11'-00" (335.3)	14'-00" (426.7)	1'-09" (53.3)	10'-3" (312.4)	4'-0" (121.9)
i3xxxx-HC	8,720 (3,956)	11,327 (5,138)	8'-00" (243.8)	11'-00" (335.3)	20'-00" (609.6)	1'-09" (53.3)	10'-3" (312.4)	4'-0" (121.9)
i4xxxx-HC	10,699 (4,853)	14,053 (6,375)	8'-00" (243.8)	11'-00" (335.3)	25'-11" (790)	1'-09" (53.3)	10'-3" (312.4)	4'-0" (121.9)
i1xxxx-FC	3,850 (1,746)	4,964 (2,252)	8'-00" (243.8)	7'-04" (223.5)	8'-00" (243.8)	1'-09" (53.3)	6'-07" (200.7)	4'-0" (121.9)
i2xxxx-FC	5,533 (2,510)	7,393 (3,354)	8'-00" (243.8)	7'-04" (223.5)	14'-00" (426.7)	1'-09" (53.3)	6'-07" (200.7)	4'-0" (121.9)
i3xxxx-FC	7,580 (3,438)	10,187 (4,621)	8'-00" (243.8)	7'-04" (223.5)	20'-00" (609.6)	1'-09" (53.3)	6'-07" (200.7)	4'-0" (121.9)
i4xxxx-FC	9,262 (4,202)	12,616 (5,723)	8'-00" (243.8)	7'-04" (223.5)	25'-11" (790)	1'-09" (53.3)	6'-07" (200.7)	4'-0" (121.9)

[a] Dimensions are approximate and should not be used for construction purposes. Dimension F Substructure Height is structurally certified from 1ft up to 10ft based on application needs.

[b] Tower weights may vary due to optional equipment, residual water from factory testing, rain, etc. Weights shown are guidelines only and do not include substructure or other accessories not directly attached to the tower module during shipping.



Performance Chart

60 Hz, 40° C., 200V, 230V, 460V or 575V

TTCC-HC Model	Fan Power		Pump Power		WBT °F (°C)	55 (12.8)	65 (18.3)	70 (21.1)	75 (23.9)	78 (25.6)	80 (26.7)	90 (32.2)
	No. of Fans	Total Power HP	Total Pump HP	Max Pump Flow	HWT °F (°C)	75 (23.9)	85 (29.4)	87 (30.6)	92 (33.3)	102 (38.9)	97 (36.1)	117 (47.2)
					CWT °F (°C)	65 (18.3)	75 (23.9)	77 (25.0)	82 (27.8)	90 (32.2)	87 (30.6)	105 (40.6)
					Cooling Capacity at Indicated Operating Conditions GPM (m³/hr)							
i10430	1	3	5	300		**59** (13.3)	**70** (15.8)	**55** (12.4)	**59** (13.5)	**87** (19.8)	**65** (14.8)	**126** (28.7)
i10450	1	5	5	300		**80** (18.1)	**92** (20.9)	**73** (16.7)	**79** (17.9)	**111** (25.3)	**85** (19.4)	**152** (34.6)
i10475	1	7.5	5	300		**98** (22.4)	**111** (25.3)	**89** (20.2)	**95** (21.5)	**130** (29.5)	**100** (22.8)	**175** (39.7)
i10410	1	10	5	300		**111** (25.3)	**124** (28.3)	**100** (22.8)	**106** (24.0)	**143** (32.5)	**111** (25.3)	**188** (42.6)
i20430	2	6	5	600		**117** (26.6)	**139** (31.6)	**110** (24.9)	**119** (27.0)	**175** (39.7)	**130** (29.5)	**253** (57.4)
i20450	2	10	5	600		**160** (36.3)	**184** (41.8)	**147** (33.3)	**158** (35.9)	**223** (50.6)	**171** (38.8)	**305** (69.2)
i20475	2	15	5	600		**197** (44.7)	**223** (50.6)	**178** (40.5)	**189** (43.0)	**260** (59.1)	**201** (45.6)	**349** (79.3)
i20410	2	20	5	600		**223** (50.6)	**249** (56.5)	**201** (45.6)	**212** (48.1)	**286** (65.0)	**223** (50.6)	**375** (85.2)
i30430	3	9	10	900		**176** (39.9)	**209** (47.5)	**164** (37.3)	**178** (40.5)	**262** (59.5)	**195** (44.3)	**379** (86.1)
i30450	3	15	10	900		**240** (54.4)	**276** (62.6)	**220** (50.0)	**237** (53.8)	**334** (75.9)	**256** (58.2)	**457** (103.8)
i30475	3	22.5	10	900		**295** (67.1)	**334** (75.9)	**267** (60.7)	**284** (64.5)	**390** (88.6)	**301** (68.3)	**524** (119.0)
i30410	4	30	10	900		**334** (75.9)	**373** (84.8)	**301** (68.3)	**318** (72.1)	**429** (97.4)	**334** (75.9)	**563** (127.8)
i40430	4	12	10	1200		**234** (53.2)	**279** (63.3)	**219** (49.8)	**238** (54.0)	**349** (79.3)	**260** (59.1)	**505** (114.7)
i40450	4	20	10	1200		**319** (72.6)	**368** (83.5)	**293** (66.7)	**316** (71.7)	**446** (101.2)	**342** (77.6)	**609** (138.4)
i40475	4	30	10	1200		**394** (89.4)	**446** (101.2)	**357** (81.0)	**379** (86.1)	**520** (118.1)	**401** (91.1)	**698** (158.6)
i40410	4	40	10	1200		**446** (101.2)	**498** (113.1)	**401** (91.1)	**424** (96.2)	**572** (129.9)	**446** (101.2)	**750** (170.4)
i10630	1	3	5	300		**59** (13.5)	**71** (16.0)	**56** (12.7)	**61** (13.9)	**90** (20.5)	**67** (15.2)	**132** (30.0)
i10650	1	5	5	300		**82** (18.6)	**95** (21.5)	**75** (17.1)	**82** (18.6)	**115** (26.2)	**87** (19.8)	**162** (36.7)
i10675	1	7.5	5	300		**102** (23.2)	**115** (26.2)	**93** (21.1)	**98** (22.4)	**137** (31.2)	**106** (24.0)	**186** (42.2)
i10610	1	10	5	300		**117** (26.6)	**130** (29.5)	**106** (24.0)	**111** (25.3)	**150** (34.2)	**119** (27.0)	**201** (45.6)
i20630	2	6	5	600		**119** (27.0)	**141** (32.1)	**111** (25.3)	**123** (27.8)	**180** (40.9)	**134** (30.4)	**264** (59.9)
i20650	2	10	5	600		**163** (37.1)	**189** (43.0)	**150** (34.2)	**163** (37.1)	**230** (52.3)	**175** (39.7)	**323** (73.4)
i20675	2	15	5	600		**204** (46.4)	**230** (52.3)	**186** (42.2)	**197** (44.7)	**275** (62.4)	**212** (48.1)	**372** (84.4)
i20610	2	20	5	600		**234** (53.2)	**260** (59.1)	**212** (48.1)	**223** (50.6)	**301** (68.3)	**238** (54.0)	**401** (91.1)

Table continues on next page →

Performance Chart

60 Hz, 40° C., 200V, 230V, 460V or 575V

TTCC-HC Model	Fan Power		Pump Power		WBT °F (°C)	55 (12.8)	65 (18.3)	70 (21.1)	75 (23.9)	78 (25.6)	80 (26.7)	90 (32.2)
	No. of Fans	Total Power HP	Total Pump HP	Max Pump Flow	HWT °F (°C)	75 (23.9)	85 (29.4)	87 (30.6)	92 (33.3)	102 (38.9)	97 (36.1)	117 (47.2)
					CWT °F (°C)	65 (18.3)	75 (23.9)	77 (25.0)	82 (27.8)	90 (32.2)	87 (30.6)	105 (40.6)
					Cooling Capacity at Indicated Operating Conditions GPM (m³/hr)							
i30630	3	9	10	900		**178** (40.5)	**212** (48.1)	**167** (38.0)	**184** (41.8)	**270** (61.4)	**201** (45.6)	**396** (89.9)
i30650	3	15	10	900		**245** (55.7)	**284** (64.5)	**226** (51.3)	**245** (55.7)	**345** (78.5)	**262** (59.5)	**485** (110.1)
i30675	3	22.5	10	900		**306** (69.6)	**345** (78.5)	**279** (63.3)	**295** (67.1)	**412** (93.6)	**318** (72.1)	**557** (126.6)
i30610	3	30	10	900		**351** (79.7)	**390** (88.6)	**318** (72.1)	**334** (75.9)	**451** (102.5)	**357** (81.0)	**602** (136.7)
i40630	4	12	10	1200		**238** (54.0)	**282** (64.1)	**223** (50.6)	**245** (55.7)	**360** (81.8)	**267** (60.7)	**528** (119.8)
i40650	4	20	10	1200		**327** (74.2)	**379** (86.1)	**301** (68.3)	**327** (74.2)	**461** (104.6)	**349** (79.3)	**646** (146.8)
i40675	4	30	10	1200		**409** (92.8)	**461** (104.6)	**372** (84.4)	**394** (89.4)	**550** (124.9)	**424** (96.2)	**743** (168.7)
i40610	4	40	10	1200		**468** (106.3)	**520** (118.1)	**424** (96.2)	**446** (101.2)	**602** (136.7)	**476** (108.0)	**802** (182.2)
i10830	1	3	5	300		**60** (13.7)	**72** (16.5)	**56** (12.7)	**61** (13.9)	**93** (21.1)	**69** (15.6)	**139** (31.6)
i10850	1	5	5	300		**85** (19.2)	**98** (22.4)	**78** (17.7)	**85** (19.4)	**123** (27.8)	**93** (21.1)	**175** (39.7)
i10875	1	7.5	5	300		**106** (24.0)	**123** (27.8)	**98** (22.1)	**104** (23.6)	**147** (33.3)	**111** (25.3)	**201** (45.6)
i10810	1	10	5	300		**123** (27.8)	**139** (31.6)	**111** (25.3)	**119** (27.0)	**163** (37.1)	**126** (28.7)	**219** (49.8)
i20830	2	6	5	600		**121** (27.4)	**145** (32.9)	**111** (25.3)	**123** (27.8)	**186** (42.2)	**137** (31.2)	**279** (63.3)
i20850	2	10	5	600		**169** (38.4)	**197** (44.7)	**156** (35.4)	**171** (38.8)	**245** (55.7)	**186** (42.2)	**349** (79.3)
i20875	2	15	5	600		**212** (48.1)	**245** (55.7)	**195** (44.3)	**208** (47.2)	**293** (66.7)	**223** (50.6)	**401** (91.1)
i20810	2	20	5	600		**245** (55.7)	**279** (63.3)	**223** (50.6)	**238** (54.0)	**327** (74.2)	**253** (57.4)	**438** (99.6)
i30830	3	9	10	900		**181** (41.1)	**217** (49.4)	**167** (38.0)	**184** (41.8)	**279** (63.3)	**206** (46.8)	**418** (94.9)
i30850	3	15	10	900		**254** (57.6)	**295** (67.1)	**234** (53.2)	**256** (58.2)	**368** (83.5)	**279** (63.3)	**524** (119.0)
i30875	3	22.5	10	900		**318** (72.1)	**368** (83.5)	**293** (66.4)	**312** (70.9)	**440** (100.0)	**334** (75.9)	**602** (136.7)
i30810	3	30	10	900		**368** (83.5)	**418** (94.9)	**334** (75.9)	**357** (81.0)	**490** (111.4)	**379** (86.1)	**658** (149.3)
i40830	4	12	10	1200		**241** (54.8)	**290** (65.8)	**223** (50.6)	**245** (55.7)	**372** (84.4)	**275** (62.4)	**557** (126.6)
i40850	4	20	10	1200		**338** (76.8)	**394** (89.4)	**312** (70.9)	**342** (77.6)	**490** (111.4)	**372** (84.4)	**698** (158.6)
i40875	4	30	10	1200		**424** (96.2)	**490** (111.4)	**390** (88.6)	**416** (94.5)	**587** (133.3)	**446** (101.2)	**802** (182.2)
i40810	4	40	10	1200		**490** (111.4)	**557** (126.6)	**446** (101.2)	**476** (108.0)	**654** (148.5)	**505** (114.7)	**877** (199.1)

Freeze Protection

XchangeTech Coils

The tower modules are designed to operate year-round in most ambient conditions. Freeze protection must be provided for the heat exchanger coils as well as the recirculating water system. When the ambient temperature falls below 32°F, heat loss from the coil will be substantial even without recirculating water flowing over the coil. The process fluid, without an applied heat load, may be prone to freezing. There are various methods to protect against coil freezing.

Ethylene and propylene glycol solutions are the best means to protect against coil freezing and are recommended for most installations. The appropriate concentration of ethylene or propylene glycol should be calculated based on expected ambient conditions and the required protection needed for the process flows. Please check with the manufacturer before using another type of industrial antifreeze solution to make sure it is compatible with the system.

It is possible to prevent the coils from freezing by maintaining adequate flow rates and heat load on the process fluid. The fluid exiting the coil must be maintained above 45°F at the full process flow rate. All piping connected to the tower should be heat traced and insulated to protect from freezing.

If the tower is going to be shut down for an extended period of time the coils can be fully drained (refer to the TTCC Installation, Operation and Maintenance Manual for additional instructions). The coils should be drained if the process fluid drops below 45°F, the ambient temperature is below freezing and the coils are not protected with glycol or polypropylene.

Tower Module Recirculating Water

When the ambient air temperature falls below 32°F, the recirculating water operating in the tower module can freeze. When the recirculating pump is off or the system is shutdown, any water collected in the internal water basin may freeze solid. You can prevent freezing by adding heat to the water left in the basin or during extended shutdowns you can drain the tower and all exposed piping.

Cycling of the recirculating water pumps to control process flow temperatures must be approached with caution. Frequent cycling of the recirculating water pump can lead to an excessive scale buildup resulting in a decrease in efficiency.

Electric Basin Heaters

In cold weather operation, the process heat load may be rejected with only dry cooling by fan operation through the VFD and the recirculating pump(s) de-energized. An optional pre-engineered basin heater package can be installed to protect the tower water basin from freezing. Whenever the recirculating pump(s) is de-energized, the basin heater system is energized keeping the basin water from freezing and ready for service if the dry cooling fan system cannot meet process fluid temperature set point and the recirculating pump must be energized. Any tower module that will not be operated when ambient temperatures are at or below freezing must have **electrical power to all optional basin heaters turned off** and the module cold water basin must be drained. **Basin heaters should be interlocked with the water circulating pump to prevent their operation when the pump is energized.**

The basin heater package includes the following components:

Standard stainless steel electric immersion heater

- Water level and temperature sensor/probe
- Wiring diagram
- Installation and operating instructions
- Required flange fittings for probe and heater pre-installed into tower basin

The basin heater control is a combination controller and probe (temperature and water level sensor) preset to 45°F (7.2°C). The control panel contains the electronic temperature/flow liquid level control, control voltage transformer, and the magnetic contactor used to energize and de-energize the heater. Each heater element contains a fused thermal cut-off device to prevent overheating the element.

The basin heater option is only for freeze protection of the recirculation water in collection basin. The basin heater option does not protect the coil during freezing weather.

Heater components are normally shipped separately for installation by others.

Remote Sump/Indoor Water Storage Tank

Another way to protect the recirculating water system is with a remote sump and indoor water storage tank. With this type of system, water flows from an indoor tank and back to the tower where it is cooled and recirculated. The water flows by gravity from the fluid cooler to the tank located in a heated space. At shutdown, all exposed water drains into the tank where it is safe from freezing.

The amount of water needed to successfully operate the system depends on the fluid cooler size on volume of water contained in the piping system to and from the tower. You must select a tank large enough to contain those combined volumes—plus a level sufficient to maintain a flooded suction on your pump. Control makeup water according to the level where the tank stabilizes during operation.

Accessories

Intelligent Controls

As the leader in cooling tower technology, Tower Tech has developed a smart control system that will provide enhanced communications that can be fully integrated into a Building Management System. Tower Tech can provide complete tower management through specific individualized data monitoring capabilities. By providing advanced diagnostics the cooling tower can be operated using proactive management to insure outstanding performance. The controls continuously optimize water and energy efficiency. The cooling tower controls can be fine-tuned providing even more savings and benefits that go beyond anything being offered in the industry. Microprocessor technology calculates the ideal metrics for optimal performance of your cooling tower. The seamless integration into your building controls system provides a holistic view complimenting the entire cooling system. A smart tower is a more efficient tower.

The Tower Tech smart controls provide standard components to efficiently operate the recirculating pump and fans while having the capability to control optional auxiliary equipment like basin heater and electronic water level control. The fans and recirculating pump are factory-wired to the control panel which is factory-tested and shipped mounted on the unit for easy commissioning on site. The controls can also be programmed for scheduled blowdown or to automate a daily flush and replenish of the recirculated water loop. A Programmable Logic Controller (PLC) receives a 4-20mA signal from an optional RTD sensor to monitor the outlet temperatures exiting the coils. The PLC provides an analog output signal to the Variable Frequency Drive (VFD) to maintain optimal cold fluid temperature for the closed loop system while optimizing fan efficiency. The smart controls provide the ultimate in temperature control, energy management, sound control and mechanical equipment longevity. Solid State water level controls monitor basin water level with solenoid-valve water makeup. Configurations include makeup along with high and low water level alarm and cutoff and electric basin heater cutoff.

Water Circulation System

Water circulation pump is a close coupled end suction pump that has an iron case with bronze impellers fitted in a stainless-steel enclosure sleeve with mechanical seal to provide optimal performance. Each pump is factory mounted and piped. The close coupled design results in improved alignment and increased seal life. Standard motor is open drip-proof suitable for outdoor service. A suction diffuser is mounted to the pump to decrease velocity, reduce turbulence and improve static pressure recovery to the pump while providing a strainer to filter the recirculating water. The recirculating pump is tailored to the unique requirements of the Tower Tech design through precision-engineering that enhance the cooling efficiency. The recirculating water is piped directly over the coil, which rejects heat through evaporative cooling using the fresh air stream and spray water. The recirculating pump is provided in 2hp, 3hp, 5hp, 7.5hp or 10hp depending on the tower model size and can be configured for 208V/460V/575V power.

After-Market Service

Tower Tech offers more than just a superior product. Tower Tech provides expert solutions that extend beyond the initial purchase. Our customer for life commitment extends across all services provided by Tower Tech including customer service. Our factory-certified service team can assist you with the maintenance of your tower. Our Customer Service Hot Line gives customers a personal link to highly experienced Service Representatives who can help you create a preventive maintenance plan for inspections and service plus provide immediate answers to any technical questions, and help you obtain spare and replacement parts as needed. Tower Tech has a fully-staffed customer service department capable of providing industry leading service, repair, commissioning and troubleshooting wherever you are located. Our preventative maintenance program assures peak tower performance through the lifespan of your investment.

About Us

Tower Tech provides innovative solutions for all your cooling tower needs. As the industry's most notable innovator, Tower Tech delivers the most advanced cooling tower design across numerous industrial markets and around the globe. From utility and industrial process applications to commercial comfort cooling needs, there is a modular tower configuration to meet any thermal demand. Tower Tech continues to break boundaries and improve on what others accept as "best". Tower Tech's four key tower design innovations ensure that your cooling project will be well positioned to service important demands: 1) energy efficiency, 2) water conservation, 3) maintenance friendly operation and 4) workplace and environmental safety.

TTCC Closed-Circuit Cooling Towers

TTCC-FC i4-Fan
8' x 25.9' x 7.33'
Shipping wt: 9,262 lbs
Operating wt: 12,616 lbs

TTCC-FC i3-Fan
8' x 20' x 7.33'
Shipping wt: 7,580 lbs
Operating wt: 10,187 lbs

TTCC-FC i2-Fan
8' x 14' x 7.33'
Shipping wt: 5,533 lbs
Operating wt: 7,393 lbs

TTCC-FC i1-Fan
8' x 8' x 7.33'
Shipping wt: 3,850 lbs
Operating wt: 4,964 lbs

TTCC-HC i4-Fan
8' x 25.9' x 11'
Shipping wt: 10,699 lbs
Operating wt: 14,053 lbs

TTCC-HC i3-Fan
8' x 20' x 11'
Shipping wt: 8,720 lbs
Operating wt: 11,327 lbs

TTCC-HC i2-Fan
8' x 14' x 11'
Shipping wt: 6,421 lbs
Operating wt: 8,281 lbs

TTCC-HC i1-Fan
8' x 8' x 11'
Shipping wt: 4,441 lbs
Operating wt: 5,555 lbs

*Substructure Height Not Included In Dimensions


TOWER TECH

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SUSTAINABLE EFFICIENCY

Tower Tech

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