FAIRWAY

SFM系列闭式冷却塔
Series closed-cooling tower

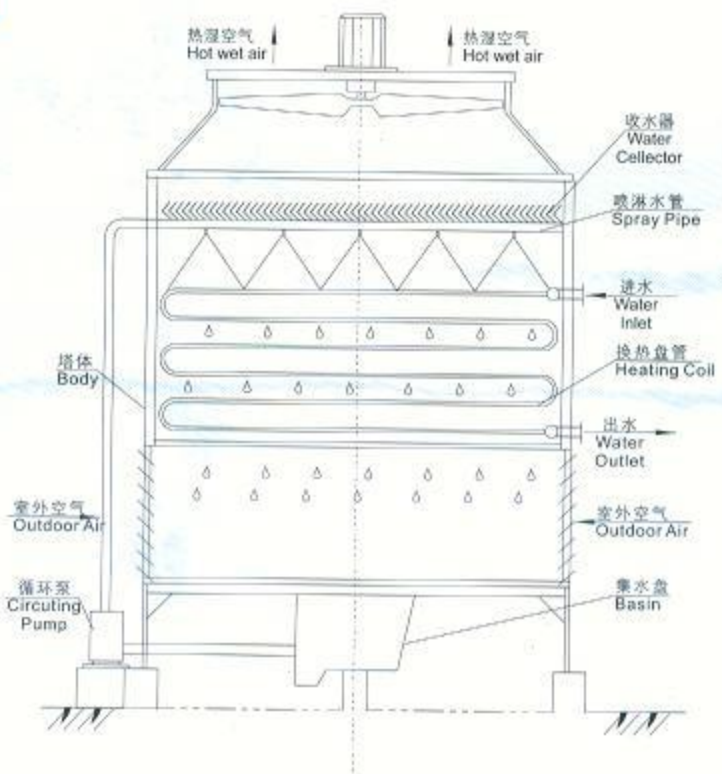
一、概述

SFM 系列闭式冷却塔是我公司与上海交通大学、电力工业部华东电力设计院三方科研人员共同研制、开发的新产品；它是集雄厚的基础理论、先进的计算机辅助设计程序、成熟的科研成果、丰富的实践经验、先进的测试条件及一流的制造工艺为一体的技术结晶；具有防止冷却水污染，减少冷却设备维修量、延长冷却设备寿命，节约补充水等开式冷却塔无法克服的优点；广泛应用于冶金、电力、化工、制造、食品等行业的再循环冷却水系统、空调系统和冷凝器的冷却水系统。
我公司为各行业用户提供的系列闭式冷却塔具有多种标准型式，同时，还可根据用户的不同要求，提供满足使用要求的非标产品。

General

SFM series closed - cooling tower is one kind of new product that researched and developed by Shangfeng cooling tower , Shanghai Jiaotong University and East - China Electric Power Design Institute of Board of Electric Power Industry . It is a crystallization of science and technical ,which based on strong basic theory , advanced computer design program , ripe study achievement ,rich practice experience , advanced test condition and excellent manufacture technology . These series products are characterized by preventing from cooled water contamination ,reducing maintenance of cooling equipment ,rising service life of cooling equipment ,saving made - up water ,etc ,which opened - cooling tower cannot have . These series apply widely to re - circulated cooled water system ,air conditioning system and cooled water system of condenser in the fields of metallurgical industrial ,electric power ,chemical industrial ,manufacture ,food industrial ,etc .
These series closed - cooling tower have various standard type to meet difference requirement of difference clients ,even non - standard products .

二、工作原理



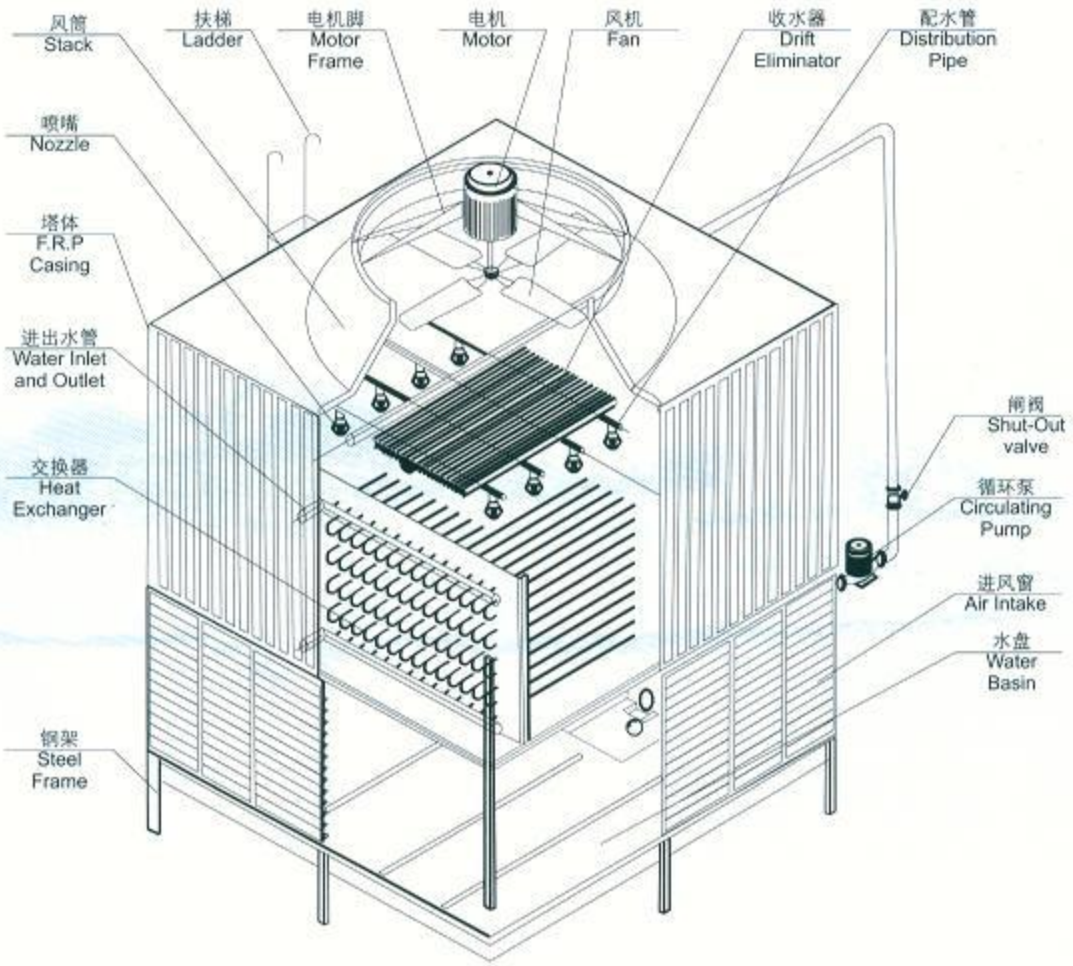
工作流体在闭式冷却塔换热盘管内运行循环流动，工作流体的热量经过盘管传给流经管外的水中，介质冷却后回到设备作循环流动，盘管上方的喷淋水沿排管均匀地喷洒在盘管的表面，在管壁外表面形成均匀的水膜，室外冷空气由塔体下方的进风口进入塔内，与喷淋水呈相反或相交方向流经盘管外的水膜层；通过接触传热和一部分喷淋水蒸发散热而吸收盘管内水中的热量而传给空气，吸收热量后的饱和热湿空气由冷却塔顶部的排风机排至大气中，其余的喷淋水流入塔体下部的集水盘，由循环水泵再输送至喷淋系统。

Operating Principle

Heat carrier liquid is flowing circulating in the heating coil inside closed - cooling tower and cooling equipment for media . Water from the face of drain tube . Cooled air outdoor enter into cooling tower through the inlet on the below body and flow across the water film layer in the direction of opposite spray water . Heat capacity result - ing from heat wet air drain to atmosphere through ventilator on the top of the cooling tower . Other spray water flow into the basin under the cooling tower and re - survey to spray system through circulating pump.

三、结构性能特点

SFM-N逆流封闭(抽风式)冷却塔



结构、性能特点 Structure and Characteristic

1、高效的换热盘管

采用紫铜管，所有的铜管均经检测合格后才焊接成盘管。为确保不泄漏，每套盘管都做1.6Mpa的水压试验。

管道呈交叉布置，并且合理的管道间距设计以及喷淋水在各管壁上形成均匀的水膜，大大地增强了蒸发冷却的效果。

盘管外空气与冷却水采用逆向流动，错位排列的管道布置使盘管具有优良的换热效果及较低的空气阻力。

Hi-efficient heating coil

Heating coil is made from ellipse copper tubes that welded after being tested . To be sure no leakage ,Pressure test at 1.6 Mpa for one set coil should be had in the water.

Ellipse tube may raise the acreage of heating coil . Intersect tube ,reasonable distance between tubes and water film on the tube wall promote evaporating and cooling efficient .

Flow direction of air outside coil and cooled water is opposite , ellipse tube and intersect tube make the beat-ing coil excellent heating efficient and lower air resistant .

2、高效的喷淋水循环系统

采用最新开发研制的ABS专用喷嘴，具有喷淋水量大、喷水分布均匀、不易堵塞等优点、合理的布水管路、喷淋高度及喷嘴布置能在盘管的外壁形成均匀水膜，并避免壁流。

喷淋水循环系统特设防水垢装置，减缓腐蚀，增加换热效果。

采用户外型循环水泵，减少能耗，减少维修，延长使用寿命。

Hi-efficient spray circulating system

ABS special nozzle has the features of much spray water ,well -distributed water and on blocked up . Rea-sonable layout of tube ,height of spray and layout of nozzle can become will - distributed water film outer wall of heating coil and preventing from reverse flow .

Spray circulating system is equipped with scour - resistant device ,which reduce corrosion and promote the efficient of heat exchange .

Circulating pump is mounted outdoor will reduce power consumption and maintenance .

3、合理的水气比

采用上海交通大学冷却塔专家多年研究冷却塔的科研成果，使塔的喷淋循环水量与冷却风量匹配达到最佳。

Reasonable water -air ratio

Spray circulating water capacity and air-flow volume is the best excellent selection according to the achieve-ment of science and research by specialist for cooling tower from Shanghai Jiaotong University .

4、高效的收水器

采用最新 PVC 材质制作的收水器，空气阻力小、收水效率高，飘水率＜0.001%。为便于冷却塔内部检修，收水器设计成可拆装型式。

Hi-efficient water collector

Water collector made of PVC material , low air resistant and high collecting efficient with higher than 99.9% of circulating water capacity. To maintenance inside cooling tower ,disassembly type design for water collec-tor shall be approved.

5、高效低噪声风机

采用获得国家发明奖的宽叶、大弦长、空间扭曲型铝合金冷却塔专用风机，具有效率高、振动小、噪声低、能耗省。

电机采用户外型冷却塔专用电机。

Hi-effcient and low noise fan

Special Aluminum fan with width blades , longer outer string for cooling tower have high efficient ,lower vibra-tion ,low noise and lower consumption .

Motor is high -temperature resistant closed motor mounted outdoor .

6、坚实耐腐的塔体

为了使闭式冷却塔能在最恶习劣的环境下保持正常运行，塔体的结构件采用钢件镀锌加防腐油漆或不锈钢制成，塔体围板及风筒集水盘采用耐腐蚀的玻璃钢构件。

Solid and corrosion resistant body

To keep closed -cooling tower noumal operation under the bad condition ,body frame and basin are made of stainless steel . Casing of body and fan casing are made of corrosion-resistant fiberglass . Connecting parts in the cooling tower are made of stainless steel material .

7、方便的选用与组装

本闭式冷却塔系列采用模块化设计，有利于用户选配。

Easy selection and assembly

Module design for these series closed -cooling tower is easy to lay out .

四、SFM系列封闭式冷却塔标准设计工况 Standard Design Work Condition

大气压力	Air pressure	p=1.004 × 10⁵pa(753mmHg)
室外空气计算湿球温度	Temperature of wet ball	τ =28℃
冷却水进塔温度	T emperature of inlet water	t =37℃
冷却水出塔温度	Temperature of outlet water	t =32℃

五、设计选型 Design selection

1、选择闭式冷却塔需已知下列技术参数
The required technical data as follows as when selecting closed -cooling tower
A、所需冷却水水量G m3/h
Required cooled water capacity
B、冷却水进塔温度 t1℃
Temperature of inlet water
C、冷却水出塔温度 t2 ℃
Temperature of outlet water
D、冷却塔安装地点的空气计算湿球温度τ ℃
Temperature of wet ball according to air temperature at site

2、所需闭式冷却塔的排热量 Required discharge heat capacity Q_s
Q_s =1.16G(t -t) kW
3、计算实际工况条件下闭式冷却塔对应于标准工况下的排热量Q标值
Calculation of discharge heat capacity Qs of standard work condition under actual work condition
Q_s =K K Q_R kW
Q_s 标准工况下闭式冷却塔的排热量KW Q_s Discharge heat capacity under standard work condition
Q_R 实际工况下闭式冷却塔的排热量KW QR Discharge heat capacity under actual work condition
K_1 湿球温变化排热量修正系数（见表1）
Discharge heat capacity correction coefficient following change of wet ball temperature (See table1)
K_2 进塔水温变化排热量修正系数（见表2）
Discharge heat capacity correction coefficient following change of temperature of outlet water (See table2)

表1湿球温度变化排热量修正系数K_1
Table 1 Discharge heat capacity correction coefficient following change of wet ball temperature

τ	24	25	26	27	28	29	30
K_1	1.27	1.25	1.16	1.08	1.0	0.91	0.82

表2进塔水温变化排热量修正系数K_2
Table 2 Discharge heat capacity correction coefficient following change of outlet water temperature

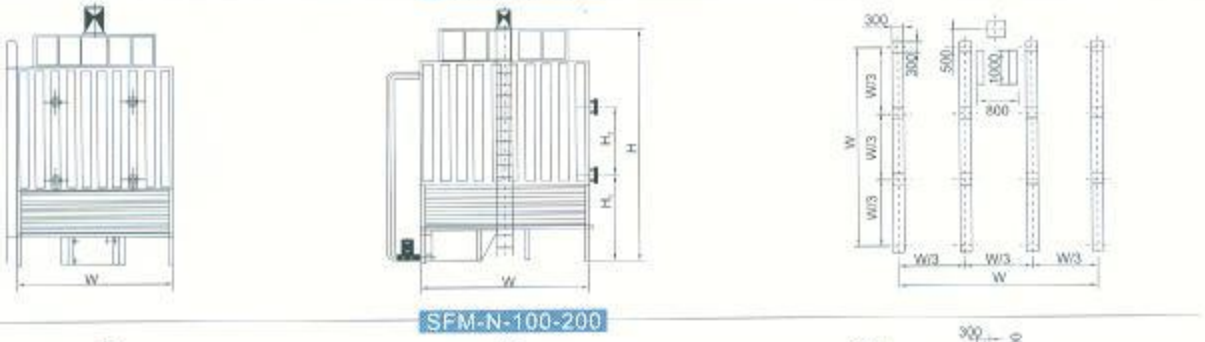
t_1	33	34	35	36	37	38	39	40	41	42
K_2	0.51	0.63	0.75	0.80	1.0	1.13	1.27	1.41	1.48	1.51

4、冷却塔型号选择根据Q_s即修正后冷却塔负荷查SFM系列闭式冷却塔标准工况下的性能参数表的“冷却能力”一栏，查找等于或大于修正后冷却塔负荷的塔型。
By applying the correction factor for discharge heat capacity detailed table 1,2,from the performance data under standard work condition ,we can read an rated heat capacity ,and then select one type referred to Qs or more .

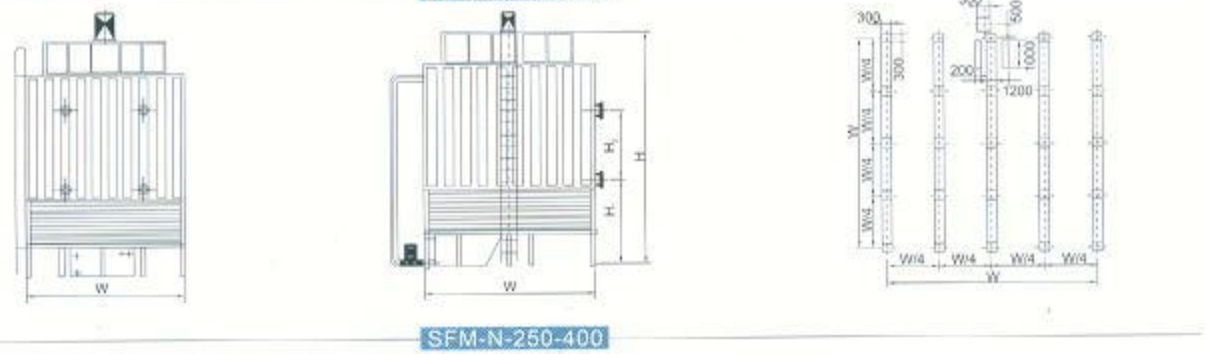
SFM–N逆流封闭(抽风式)标准冷却塔外形、基础图

SFM-N cooling tower outline and foundation drawing

SFM-N-20-75



SFM-N-100-200



SFM-N-250-400

SFM–N 逆流封闭（抽风式）标准冷却塔技术规格表

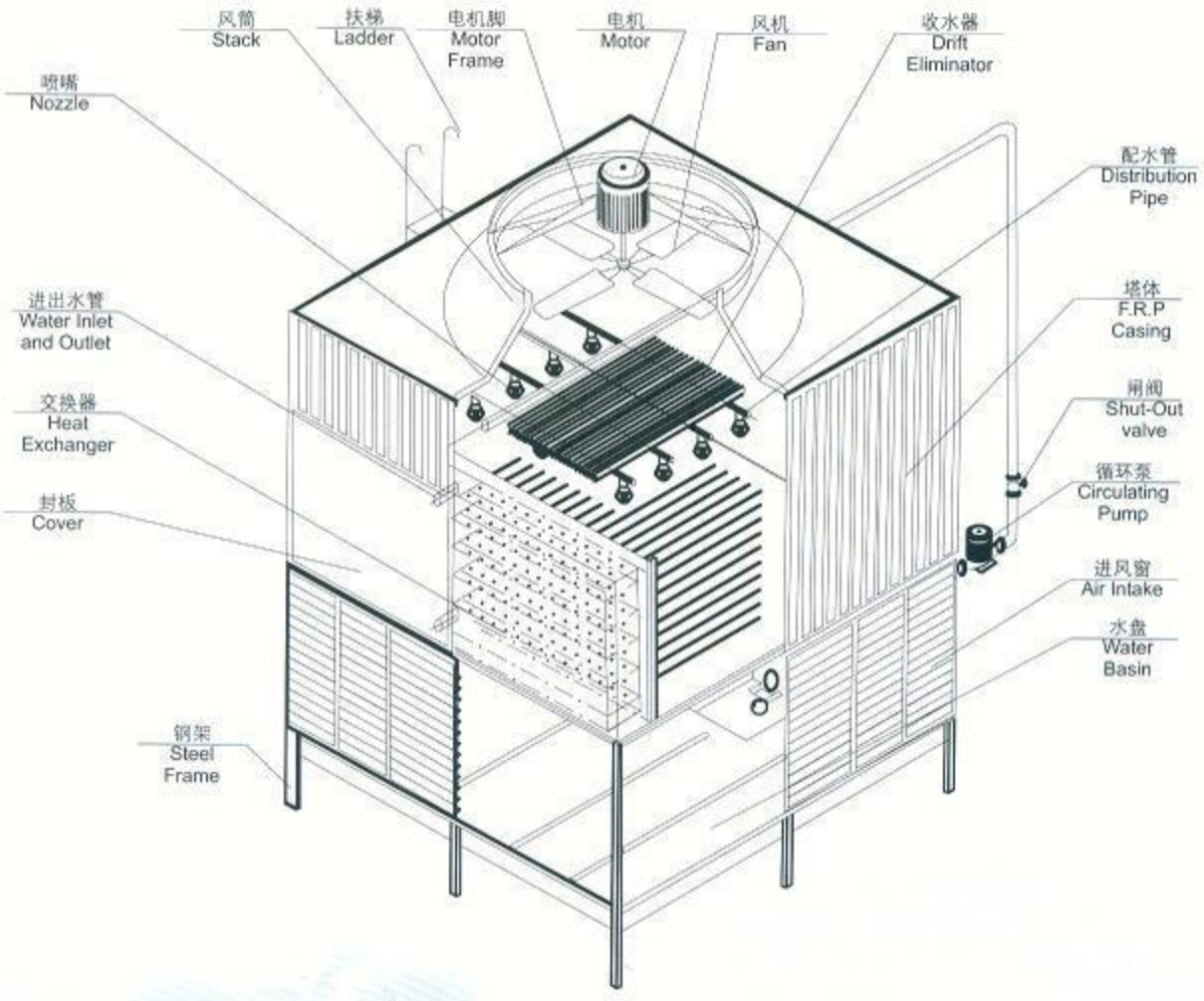
SFM-N series closed cooling tower technical specification

进出水温（37-32℃） Hot cold water temperature (37-32℃)

型号 Model	处理水量 m^3/h	冷却能力 Kw	外形基础 W mm	H mm	H1 mm	H2 mm	风机直径 Φmm	电机功率 Kw	管内水头损失 mH_2O	喷淋泵功率 Kw	喷淋补充量 m^3/h	配管尺寸 进出	补水	溢流	排污	制品重量 Kg	运转重量 Kg	噪音 dB(A)
SFM-N-20	20	116	1600	3550	1450	1400	1200	1.5	5.2	1.1	0.3	50	25	50	65	1890	3250	64.5
SFM-N-30	30	174	2000	3750	1450	1400	1500	2.2	5.3	1.5	0.6	65	25	50	65	2510	3980	65.5
SFM-N-50	50	290	2600	3900	1450	1600	1780	3.0	5.5	2.2	1.0	100	25	50	65	2940	4380	66.0
SFM-N-75	75	435	3200	4090	1450	1600	2000	4.0	5.5	3.0	1.5	100	25	50	65	3780	5810	66.5
SFM-N-100	100	580	3600	4950	1950	1800	2800	5.5	5.6	4.0	2.0	150	32	65	65	4730	7540	67.5
SFM-N-150	150	870	4500	5050	1950	1800	3330	7.5	5.6	5.5	3.0	2-150	32	65	65	7550	10800	68.0
SFM-N-200	200	1160	5250	5250	2500	2000	3630	11.0	5.7	7.5	4.0	2-150	32	65	65	8570	13060	69.5
SFM-N-250	250	1450	5800	5900	2500	2000	3800	15.0	5.7	11.0	5.0	2-200	32	65	65	10910	16530	70.0
SFM-N-300	300	1740	6300	6100	2500	2000	3800	18.5	5.8	11.0	6.0	2-200	32	65	65	13280	19570	71.0
SFM-N-350	350	2030	6800	6200	2500	2200	4200	22.2	5.8	18.5	7.0	2-200	32	65	65	15320	24250	72.0
SFM-N-400	400	2320	7500	6300	2500	2200	4200	30.0	5.8	18.5	8.0	2-200	32	65	65	17900	27810	72.5

SFM–Y逆流封闭(抽风式)工业冷却塔结构图

Structure of SFM-Y Series Closed-cooling Tower

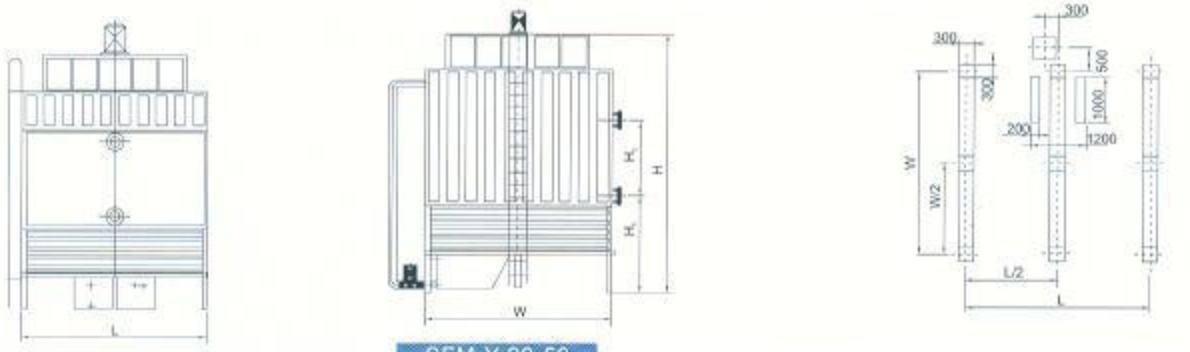


结构特点：

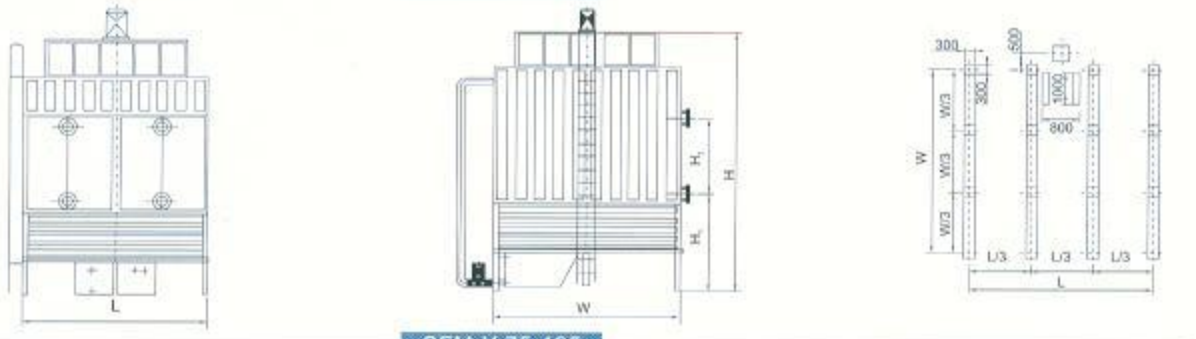
1、检修方便
采用封头结构，对热交换盘管的检修非常方便。
2、外形漂亮
外形尺寸小，高度低，重量轻，可以多种形式组合布置。
3、高强轻质
塔体采用FRP材料，抗老化，不变形，褪色，能经受8级地震，12级台风袭击，雪载>200kg/m²。
4、可靠耐用
钢支架采用镀锌处理外涂保护油漆，耐腐性好，使用寿命长。
5、结构先进
采用先进的设计思路，产品结构先进合理，冷却能力超群。
6、环保节能
采用户外型循环泵，高效收水器，独特的消声技术，减少对环境的影响，同时大大节约水的损耗。

SFM–Y逆流封闭(抽风式)工业冷却塔外形、基础图

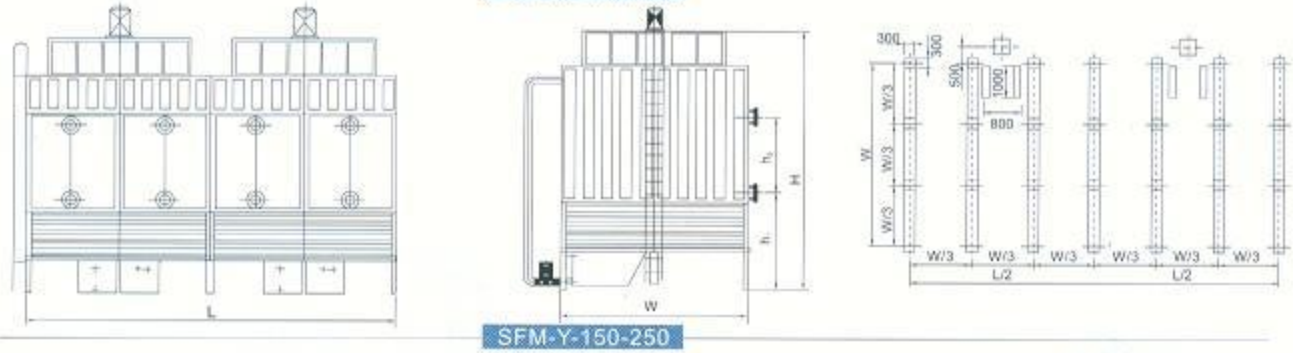
SFM-Y cooling tower profile and foundation illustration



SFM-Y-20-50



SFM-Y-75-125



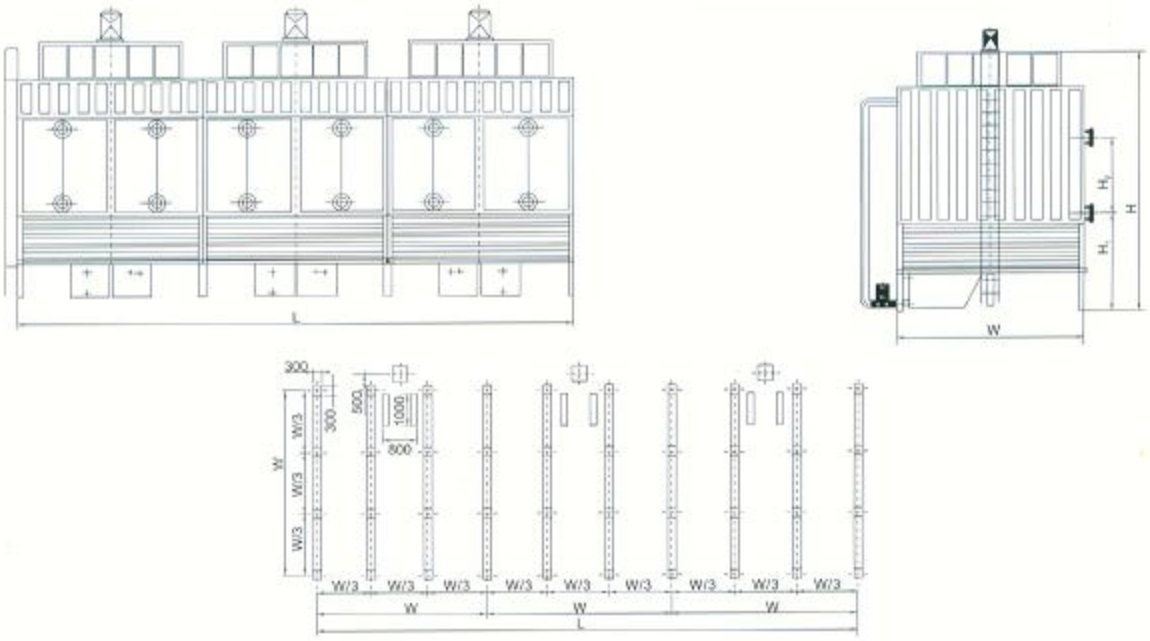
SFM-Y-150-250

SFM–Y 系列逆流封闭(抽风式)工业冷却塔技术规格表

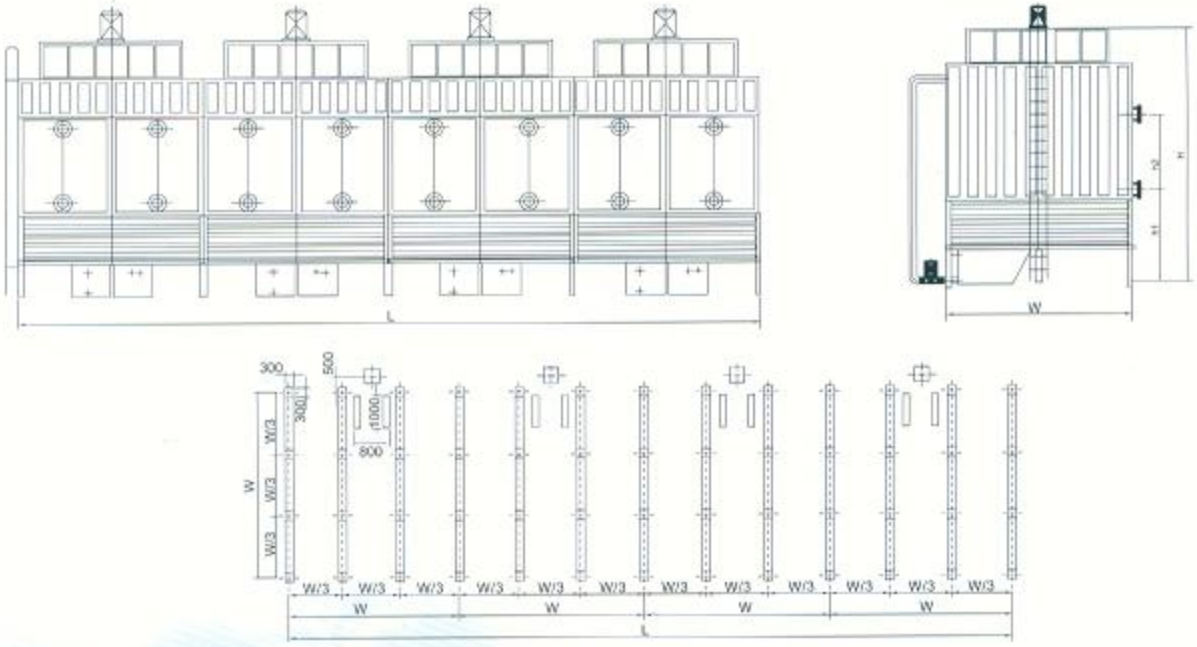
SFM-Y series closed cooling tower technical specifieation

进出水温（55-35℃）Hot cold water temperature（55-35℃）

型号 Model	处理水量 m^3/h	冷却能力 Kw	外形基础 W mm	L mm	H mm	H1 mm	H2 mm	风机直径 Φmm	电机功率 Kw	管内水头损失 mH_2O	喷淋泵功率 Kw	喷淋水补充量 m^3/h	配管尺寸 进出	补水	溢流	排污	制品重量 Kg	运转重量 Kg	噪音 dB(A)
SFM-Y-20	20	464	1600	1600	3550	1450	1400	1200	1.5	5.2	1.1	0.3	50	25	50	65	2490	3850	64.5
SFM-Y-30	30	696	2000	2000	3750	1450	1400	1500	2.2	5.3	1.5	0.6	65	25	50	65	3260	4730	65.5
SFM-Y-50	50	1160	2600	2600	3900	1450	1600	1800	3.0	5.5	2.2	1.0	100	25	50	65	3840	5280	66.0
SFM-Y-75	75	1740	3200	3200	4090	1450	1600	2000	4.0	5.6	3.0	1.5	2-80	25	50	65	4980	7010	66.5
SFM-Y-100	100	2320	3600	3600	4950	1950	1800	2800	5.5	5.6	4.0	2.0	2-100	32	65	65	6030	8840	67.5
SFM-Y-125	125	2900	4000	4000	4950	1950	1800	2800	7.5	5.6	4.0	2.4	2-100	32	65	65	7250	10440	67.5
SFM-Y-150	150	3480	3200	6400	4090	1950	1600	2000	2×4.0	5.6	2×3.0	1.5	4-80	32	65	65	9950	13200	68.0
SFM-Y-200	200	4640	3600	7200	4950	1950	1800	2800	2×5.5	5.6	2×4.0	2.0	4-100	32	65	65	11170	15600	69.5
SFM-Y-250	250	5800	4000	8000	4950	1950	1600	2800	2×7.5	5.6	2×4.0	2.4	4-100	32	65	65	13910	19530	70.0



SFM-Y-300-375



SFM-Y-400-500

SFM–Y系列逆流封闭(抽风式)工业冷却塔技术规格表

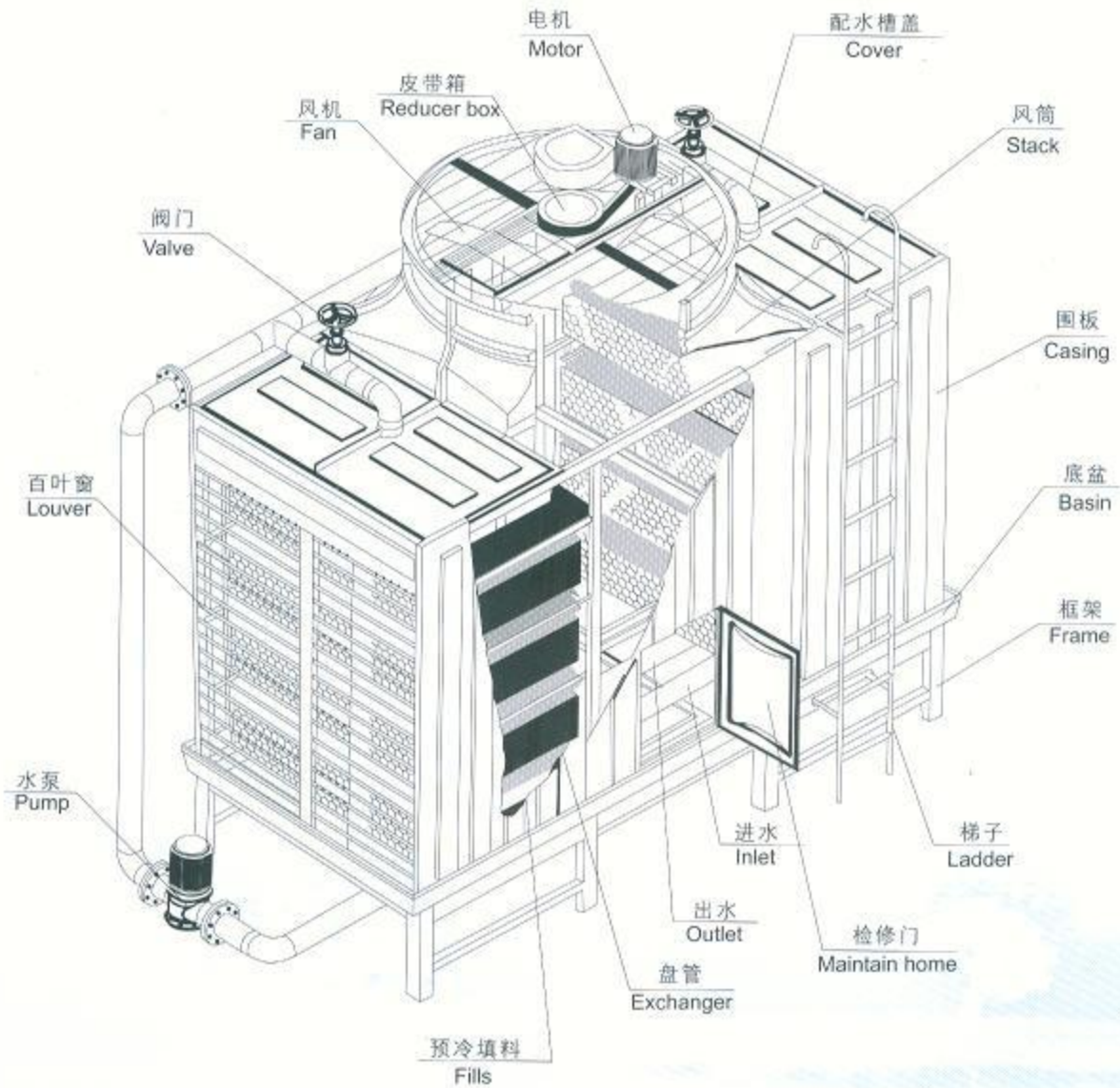
SFM-Y series closed cooling tower technical specification

进出水温（55-35℃) Hot cold water temperature（55-35℃)

型号 Model	处理水量 m^3/h	冷却能力 Kw	外形基础(mm) W mm	L mm	H mm	H1 mm	H1 mm	风机直径 Φmm	电机功率 Kw	管内水头损失 mH_2O	喷淋泵功率 Kw	喷淋水补充量 m^3/h	配管尺寸mm 进水	补水	溢流	排污	制品重量 Kg	运转重量 Kg	噪音 dB(A)
SFM-Y-300	300	6960	3600	10800	4950	1950	1800	2800	3×5.5	5.6	3×4.0	6.0	6-100	32	65	65	17180	23470	71.0
SFM-Y-375	375	8700	4000	12000	4950	1950	1800	2800	3×7.5	5.6	3×4.0	7.2	6-100	32	65	65	19820	28750	72.0
SFM-Y-400	400	9280	3600	14400	4950	1950	1800	2800	4×5.5	5.6	4×4.0	8.0	8-100	32	65	65	23100	33010	72.5
SFM-Y-500	500	11600	4000	16000	4950	1950	1800	2800	4×7.5	5.6	4×4.0	9.6	8-100	32	65	65	26400	37200	73.0

SFM-H系列(抽风式)标准冷却塔 结构图

Structure of SFM-H Senies Closed-cooling Tower



结构特点：

1、SFM-H系列横流封闭(抽风式)冷却塔经过多年来不断开发、完善的新产品,采用矩形横流式低噪音设计,配件结合方便,结构轻盈,采用模块化设计,方便现场安装。

2、冷却塔内盘管采用无缝脱氧铜管,传热效果特佳,钢构件采用热浸镀锌,以及玻璃钢件围护,美观,牢固。风筒配水盘采用玻璃钢材质,散热片采用PVC。循环泵采用全封闭管道泵,具有噪音小,寿命长的优点。

3、运行成本低:采用高效低噪音风机,电机,配合新型低阻力热交换盘管,耗电低,并能有效降低噪音,同时减少电耗,节约成本。

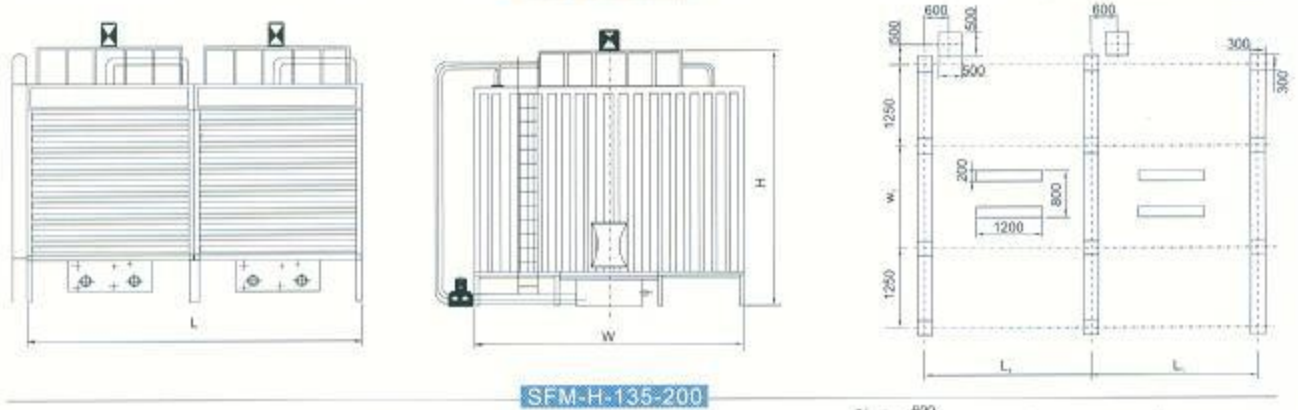
4、新型热交换器和喷水方式,大幅度提高热交换性能,比旧式机型节约15%的空间和重量。同时内置式接管,大大方便管道安装。

FAIRWAY

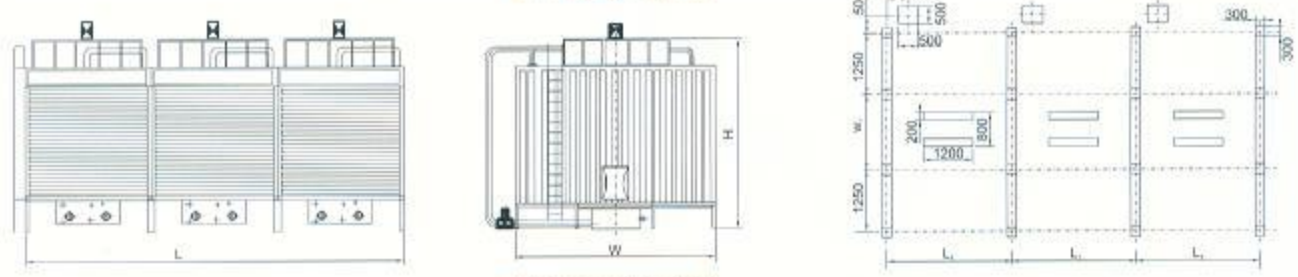
SFM–H系列横流封闭(抽风式)标准冷却塔外形、基础图

SFM-H cooling tower outline and foundation drawing

SFM-H-50-100



SFM-H-135-200



SFM-H-250-300

SFM–H系列横流封闭(抽风式)标准冷却塔技术规格表

SFM-H series closed cooling tower technical specification

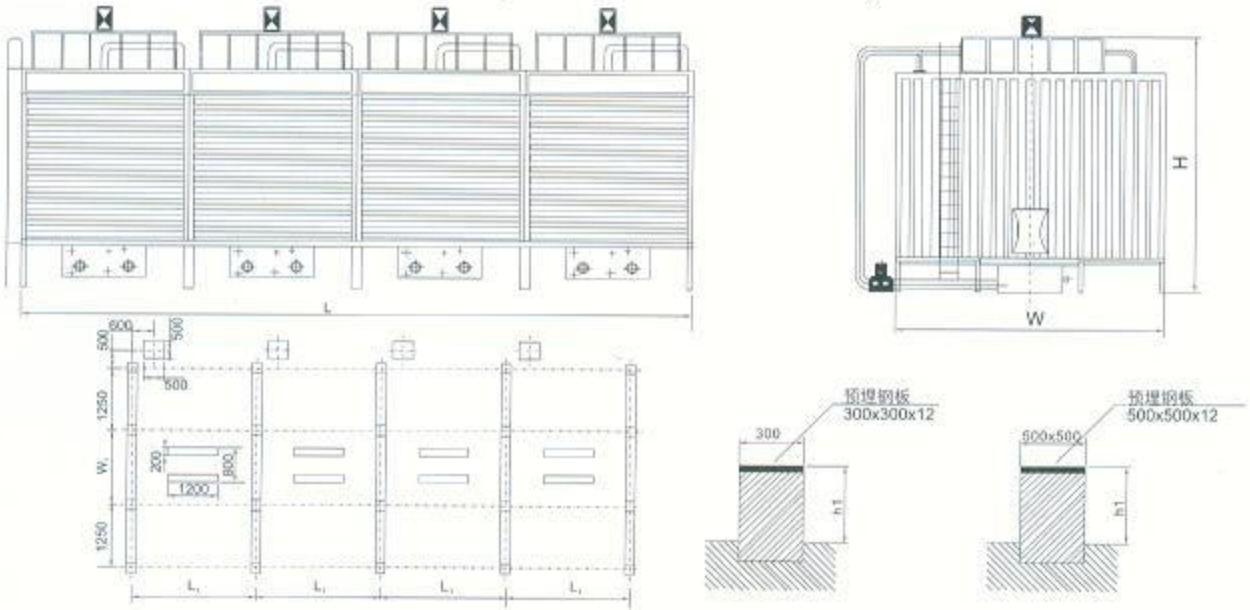
进出水温（37-32℃）Hot cold water temperature (37-32℃)

型号 Model	处理水量 m^3/h	冷却能力 Kw	外形基础(mm) L	W	H	L1	W1	风机直径 Φmm	电机功率 Kw	管内水头损失 mH_2O	喷淋泵功率 Kw	喷淋水补充量 m^3/h	配管尺寸(mm) 进出	补水	溢流	排污	制品重量 Kg	运转重量 Kg	噪音 dB(A)
SFM-H-50	50	290	2155	4080	4450	2005	1600	1780	4.0	5.4	3.0	1.1	65	25	50	65	2490	3850	64.5
SFM-H-67.5	67.5	391	2360	4080	4450	2210	1600	2000	5.5	5.4	4.0	1.5	100	25	50	65	3260	4730	65.5
SFM-H-85	85	493	2660	4380	4450	2510	1900	2360	5.5	5.6	4.0	1.9	100	32	50	65	3840	5280	66.0
SFM-H-100	100	580	2960	4380	4450	2810	1900	2360	7.5	5.8	5.5	2.2	150	32	50	65	4980	7010	66.5
SFM-H-135	135	783	4570	4080	4450	2210	1600	2000	2×5.5	5.4	2×4.0	3.0	2-100	2×25	2×50	65	6030	8840	67.5
SFM-H-170	170	986	5170	4380	4450	2510	1900	2360	2×5.5	5.6	2×4.0	3.9	2-100	2×32	2×65	65	7250	10440	67.5
SFM-H-200	200	1160	5770	4380	4450	2810	1900	2360	2×7.5	5.8	2×5.5	4.6	2-150	3×32	3×65	65	9950	13200	68.0
SFM-H-250	250	1450	7680	4380	4450	2510	1900	2360	3×5.5	5.6	3×4.0	5.9	3-100	3×32	3×65	65	11170	15600	69.5
SFM-H-300	300	1740	8580	4380	4450	2810	1900	2360	3×7.5	5.8	3×5.5	6.9	3-150	3×32	3×65	65	13910	19530	70.0

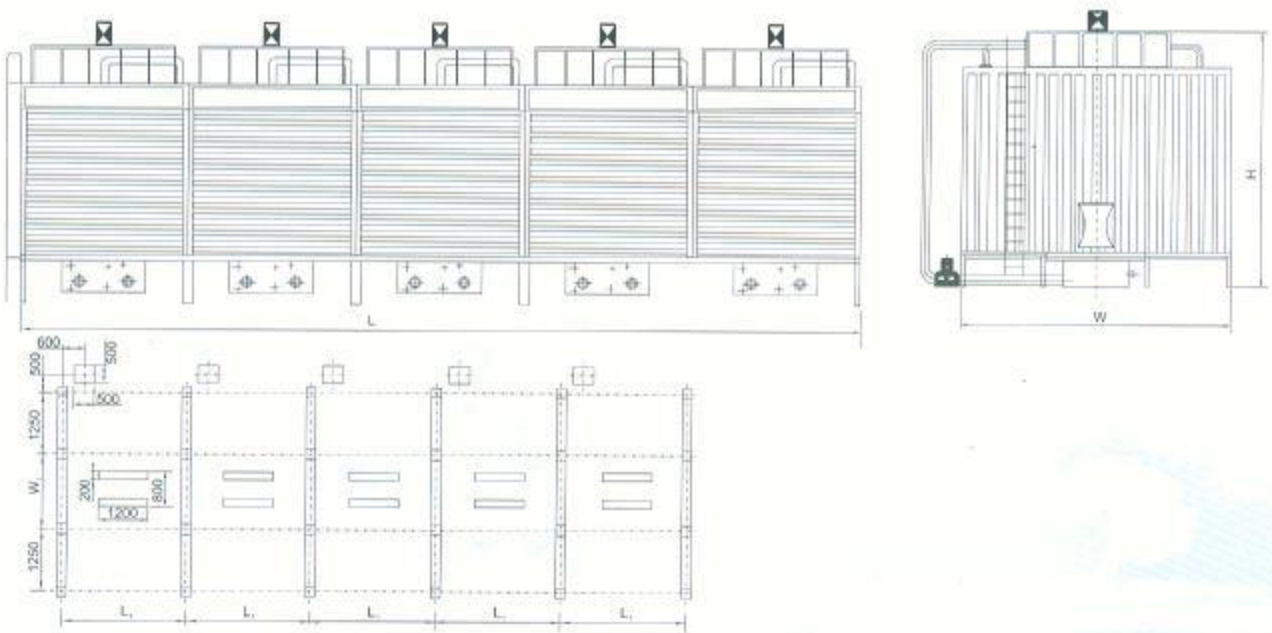
FAIRWAY

SFM–H系列横流封闭(抽风式)标准冷却塔外形、基础图

SFM-H cooling tower outline and foundation drawing



SFM-H-350-400



SFM-H-500

SFM–H系列横流封闭(抽风式)标准冷却塔技术规格表

SFM-H series closed cooling tower technical specification

进出水温（37-32℃）Hot cold water temperature (37-32℃)

型号 Model	处理水量 m^3/h	冷却能力 Kw	外形基础(mm) W	L	H	L1	W1	风机直径 φmm	电机功率 Kw	管内水头损失 mH_2O	喷淋泵功率 Kw	喷淋水补充量 m^3/h	配管尺寸(mm) 进出	补水	溢流	排污	制品重量 Kg	运转重量 Kg	噪音 dB(A)
SFM-H-350	350	2030	10190	4380	4450	2510	1900	2360	4×5.5	5.6	4×4.0	7.8	4-100	4×32	4×65	4×65	13260	22360	72.5
SFM-H-400	400	2320	11390	4380	4450	2810	1900	2360	4×7.5	5.8	4×5.5	9.0	4-150	4×32	4×65	4×65	15340	25740	73
SFM-H-500	500	2900	14200	4380	4450	2810	1900	2360	5×7.5	5.8	5×5.5	9.9	5-150	5×32	5×65	5×65	19200	32200	74

一、安装场地

A、地面承载，参考冷却塔之运行重量以及设计安全系数，校核安装地基的承载参力。
B、环境条件：
1、冷却塔宜安装在通风良好、远离生活、工作区的场地，以减少噪音和湿热空气的影响。入口与平行建筑物之间最短距离不小于塔高的1.5倍.必要时在墙上设置百叶窗。
2、不宜安装在有湿热、有害空气、粉尘污染的区域内。

Location

A . In terms of ground bearing capability ,check the bearing capability of the installation location against the operating weight and the design safety factor of the cooling tower .
B. Ambient condition :
1.install the cooling tower should be at a well-ventilated place and far from living or industrial zone ,so as to be less influenced by noise and hot and damp exhaust air ,the minimum distance from the air inlet to any possible obstacle should be no less than 1.5 times of the tower height .
2. Do not install the cooling tower where the air is hot and damp or heavily polluted by harmful gases and dusts .

二、安装须知

A、冷却塔基础应按公司提供的有效基础图尺寸进行施工，基础安装面要求平整并保持在同一标高，标高允许误差为±5mm.
B、玻璃钢、热交换盘管、风机等部件在运输、吊装、存放时，要小心轻放，妥善保管，不准在上面压置重物，以免因存放不良而使产品变形或损坏；
C、冷却塔管道设计和安装应符合系统的设计标准和通行的工程实践经验，封闭式冷却塔推荐用于需要封闭循环的系统中，在系统中应设置调节阀，以便控制盘管内的流量；
D、管道系统设计时应考虑能使换热盘管内的水全部放尽，在管道的最高处设置放气阀，要低处设置放水阀；
E、管道用支架固定，不得将荷载作用于冷却塔的接管或框架上。

Points for attention during installaton

A . Conduct the foundation construction at fixed location in accordance with the foundation dimensions given by our company be sure that installation surface of the foundation is flat and smooth and the same elevation tolerance being within 5mm.
B . Properly pile up the FRP parts and exchange coils in case of storage ,do not put heavy goods on them to prevent the parts from being deformed and damaged due to improper storage . Keep the fan ,water distributor in good order to avoid any damage .
C. Designing and installing pipe in line with designing standard and works practice experience .closed cooling tower only application in closedcycle cooling system . We should set controlling valve for control water flows through coils .
D . Ensure drain off the water of heating exchange coils when making the system design ,set air bleed valve at high place and drain valve at low place ,dimension is proper between the valves ,ensure drain off the water in heating exchange coils when shutting down controling valve ,opening air valve and drain valve .
E. Fix pipeline with support .you should not incease weight to the coopling tower .

三、起动前准备

A、检查底盘内水位是否正常，水质是否符合要求。
B、检查风机、喷淋泵电机接线是否正确；
C、检查供电电源是否符合电机性能要求AC380V±10%范围内。
D、打开放气阀以驱走系统内的空气，正常运行时关闭放气阀。

Ready for start

A. Check if water levil in the water tand is ok and if water quality conform to the requirement .

B. Check fan pump’ s oporations is ok.

C. Check if the power supply is with the range of 10% AV380V.

D. Open air bleed valve to draio the air is heating oxchange and the air bleed valve will be shutted when operating

四、冬季防冻措施

冬季停运期，必须将换热盘管内的水全部放光，以防天冷将铜管冻裂。并采取防冻措施。

Anti freezing measures in winter

Anti freezing measures should be taken for the pond and coils during the shutdown period in winter

五、水质处理

冷却塔的补充水最好是经过水质处理的。
盘管外侧的喷淋水由于吸收热量而蒸发，加上吸入的杂质，水中杂质不断增加，硬度会不断上升，容易在管道内和换热盘管表面结垢，产生藻类及腐蚀部件等，从而降低冷却效果和缩短设备使用寿命，因此建议配备适当的旁滤、加药设备，但所用防蚀、阻垢剂不能对铜管及钢件有腐蚀性。
根据水质情况，及时进行排污，保持池中的水的PH在6.5-8.5之间。

Water treatment

Impurities in spray water ,remaining as the water evaporates after absorption of heat load,and impurities in air getting in-to the spray system,are apt to cause problems such as scale ,sludge and corrosion ,as a result ,cooling perfomance will be reduced and service life of equipment be shortened . For this reason ,it is necessary to carry out some kind of water t-reatment . However ,the chemicals used for such treatment shall not cause any corrosion to the copper tubes and zincpl-ated metal parts ,keep the PH value of the water in the pond between 6.5-8.5

六、维护保养

冷却塔水池、热交换盘管及其他部件上的积污物应定期清理，保证各部件的畅通和清洁，清洗工作

应每年进行一次，清洗工作应当由专业人员进行，或与本公司联系。

Maintenance

It is imperative to get rid of the filth and dirties accumulated in the cooling water pond and on the heat exchange coils a-nd packing timely ,so as to ensure against blockage formed in packing ,heat exchange coils and pond ,it is recommended to ask specialized company to do the jod ,normally once a year .

七、其它

1、我公司可以按客户的实际使用工艺要求进行个性化设计，为您提供最合理的方案，使您达到最佳的经济效益。
2、超低噪音所需消声装置可另行加设以适应用户的不同需要。
3、可以为客户进行冷却塔的使用、维护等方面的技术培训。
4、如有 不详之处请与本公司相关部门联系。
5、因公司的技术不断创新，本册数据如有变更，恕不另行通知，请以公司最新提供图纸为准。

Other

1. Our company is capable of making special design ,as customers may have different requirements for design working conditions .we will work out the optimum plan for you ,enabling you to obtain the best economic result .
2. Noise silencing device necessary for low noise and ultra-low noise operation can be supplied as an option at the re-quest of the customer .
3. We train operator according to customer s requirements .
4. As technology develops very fast ,the information contained in this manual may be subject to change without notice please follow the dimension in the drawings provided by our company .
5. If you have any doubts or any special requests ,please contact the chief engineer office or the research institute of o-ur company.