GENIUS

GKS SERIES

CROSSFLOW COOLING TOWER

MEMBER

ABOUT **US**

Genius Premier Sdn Bhd was established in 2002 . We specialize in providing solutions in the cooling tower industry with a myriad of products and services. Some of our featured products include the Crossflow Cooling Tower and the Counterflow Cooling Tower.

With more than 11 years of experiences in the industry, our cooling towers have been installed in various industries such as hospitals, universities and other various commercial infrastructures across the country.

Genius Premier Sdn Bhd continues to innovate, improvise and providing quality products to meet clients' needs. Our well-trained and qualified staffs are equipped with experience and expertise are striving to serve you better.

Due to business expansion and growth, a new manufacturing facility was constructed in 2012. Genius Premier would continuously maintain product innovation and engineering while overlooking the production of the cooling towers. A subsidiary company, Genius Cooling Towers Sdn Bhd was established in 2013 to oversee the role of sales and marketing of Genius brand cooling towers so that Genius Premier can continue to focus on delivering high quality products.

The new state of the art manufacturing facility located in Nilai, Negeri Sembilan is equipped with a dedicated CTI test laboratory for our cooling towers to conform and to be assessed by CTI to meet industry standards.

The new facility is built on 2.2-acre land with over 50,000 square feet of production space, 6,000 square feet of factory office space and 8,000 square feet dedicated for CTI test facilities.

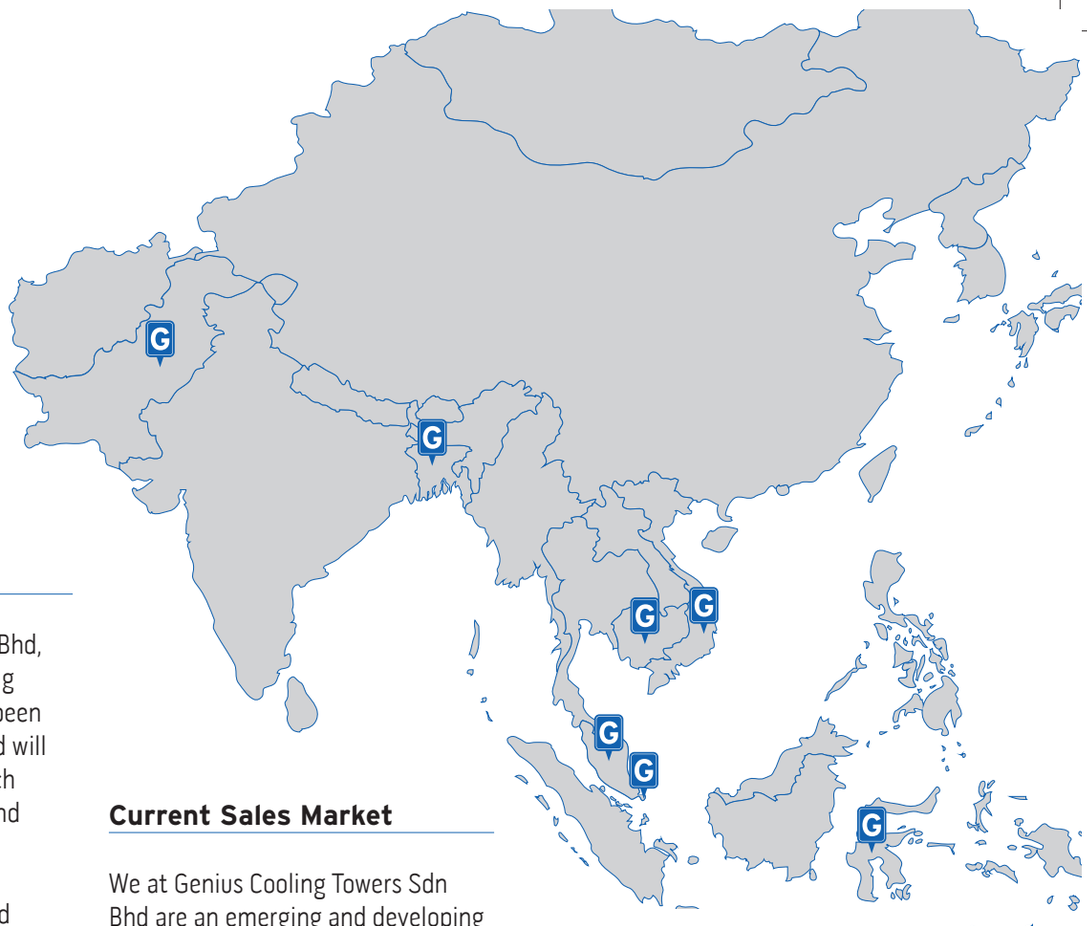
Hot water boiler for CTI test facility

Genius Cooling Tower CTI test facility

The Cooling Technology Institute is a nonprofit self-governing technical association. It is dedicated to improvement in technology, design, performance and maintenance of evaporative heat transfer systems. In addition, water and air pollution have always been and will continue to be of prime concern to CTI and its members.

©

MEMBER



Products and Services

At Genius Cooling Towers Sdn Bhd, our priority is to provide cooling solutions. Our solutions have been following ISO 9001 : 2008 and will be certified by the end of March 2015. Here are the products and services we provide:

- Designing, manufacturing and marketing of round and rectangular cooling towers
- Manufacturing of compatible spare parts for all brands of cooling towers
- Customization of cooling tower
- Refurbishment of cooling tower
- Servicing and maintenance of cooling tower
- Feasibility and field studies for cooling tower upgrade

Current Sales Market

We at Genius Cooling Towers Sdn Bhd are an emerging and developing brand with unique design features. This provides a wider market share in Malaysia. Our cooling towers have been installed in various commercial infrastructures across Malaysia.

Our cooling towers are also exported mainly to ASEAN & Middle Eastern countries such as: Vietnam, Singapore, Cambodia, Indonesia, Pakistan and Bangladesh. We are currently developing markets in both foreign and domestic regions with continuous product improvement.

Genius New Plant

8,000 square feet CTI test facility

Genius Cooling Tower manufacturing facility in Nilai, Negeri Sembilan with 50,000 square feet production area

INTRODUCTION

GENIUS™ GKS SERIES COOLING TOWER

GKS Series Quick Selection Table

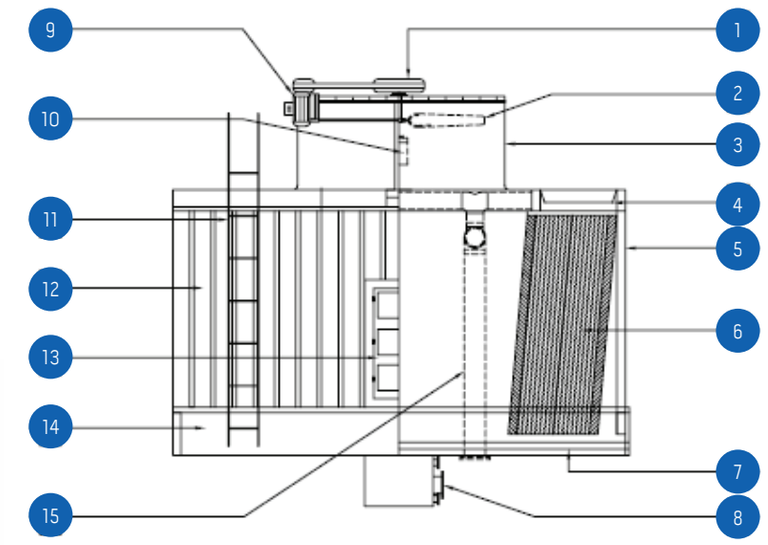
The diagrams below show the common combinations of various cold water, hot water, wet bulb temperature. However, if there is a difference in temperature combiation, please contact the company for a selection of the cooling tower for one cell tower by our computer softwate.

USGPM cooling capacity at indicated Hot Water, Cold Water and Wet-Bulb Temperatures

Deg F	In	95	95	95	98.6	95	97	98	98.6	97	100	98.6	100	100
	Out	85.1	85.1	85.1	89.6	86	87	88	89.6	87	90	89.6	90	90
	WB	80.6	81.5	81.86	80.6	81	81	82	81.5	82	82	82.4	83	84

Deg C	In	35	35	35	37	35	36.11	36.67	37	36.11	37.78	37	37.78	37.78
	Out	29.5	29.5	29.5	32	30	30.56	31.11	32	30.56	32.22	32	32.22	32.22
	WB	27	27.5	27.7	27	27.22	27.22	27.78	27.5	27.78	27.78	28	28.33	28.89

Model	HRT	US GPM												
GKS 350-1B	350	661	586	554	1203	767	883	855	1145	740	1040	1057	969	899
GKS 400-1B	400	762	666	634	1383	881	952	969	1304	850	1189	1216	1106	1022
GKS 450-1B	450	837	752	712	1555	969	1070	1101	1471	956	1339	1366	1242	1145
GKS 500-1B	500	943	836	792	1718	1101	1189	1216	1630	1062	1485	1520	1383	1304
GKS 550-1B	550	1030	920	871	1890	1218	1308	1318	1775	1168	1665	1661	1551	1427
GKS 600-1B	600	1110	999	951	2062	1322	1427	1454	1956	1278	1784	1824	1661	1542
GKS 650-1B	650	1203	1086	1028	2233	1432	1546	1575	2119	1374	1918	1976	1804	1661
GKS 700-1B	700	1322	1171	1108	2405	1542	1665	1696	2282	1489	2084	2115	1934	1797
GKS 750-1B	750	1414	1254	1188	2577	1612	1806	1824	2445	1586	2220	2273	2075	1930
GKS 800-1B	800	1520	1332	1268	2749	1762	1903	1938	2608	1700	2379	2432	2211	2044
GKS 850-1B	850	1628	1421	1346	2921	1878	2018	2038	2753	1815	2599	2581	2423	2188
GKS 900-1B	900	1696	1504	1424	3093	1982	2141	2181	2943	1912	2678	2731	2489	2291
GKS 950-1B	950	1813	1590	1505	3264	2093	2261	2318	3075	2038	2890	2881	2687	2476
GKS 1000-1B	1000	1885	1672	1584	3436	2203	2379	2423	3260	2123	2974	3040	2767	2573
GKS 1150-1B	1150	2219	1924	1821	3952	2542	2738	2768	3688	2448	3465	3445	3232	2999
GKS 1250-1B	1250	2355	2090	1980	4295	2685	2975	3040	4075	2645	3700	3790	3460	3215
GKS 1400-1B	1400	2644	2342	2216	4810	3084	3330	3392	4564	2978	4168	4230	3868	3594
GKS 1500-1B	1500	2829	2508	2376	5154	3303	3567	3648	4890	3186	4455	4560	4149	3912



DESCRIPTION

1. V-BELT AND PULLEY SYSTEM
2. FAN ASSEMBLY
3. FAN STACK
4. HOT WATER BASIN
5. MAIN FRAME STRUCTURE
6. HIGH PERFORMANCE FILM FILL PACK
7. COLD WATER BASIN FLOOR
8. SUCTION SUMP
9. GEAR REDUCER SYSTEM
10. MOTOR
11. LADDER
12. CASING
13. INSPECTION FLOOR
14. COLD WATER BASIN FRAME
15. INTERNAL PIPING

Tower Construction

Tower casing body is made out of F.R.P. (Fiberglass Reinforced Plastics) which is corrosion free, very durable and yet light. Furthermore the body is coated with a special epoxy consist of anti-ultraviolet agent making the tower body more resistant to UV sunlight. The tower main structure frame is using steel which has undergo hot dipped galvanization (HDG) process to prevent rust.

Cold Water Basin

The cold water basin is constructed from F.R.P. (Fiberglass Reinforced Plastics) which is corrosion free and is supported by HDG steel frame underneath. The cold water basin is also slopping basin to ensure the dirt and sediments trapped inside the basin is being diverted towards the depressed sump in the centre of basin.

The depressed sump will prevent air lock from occurring during the tower operation. The sump is also supplied with suction strainer, makeup water ball valve, overflow and drain connection.

There is a high quality special mat above the cold water basin that will absorb most of the water drop noise.

Mechanical drive system

Fans are of axial type designed to deliver air performance at low noise level. Fan blades material shall be FRP as standard and aluminium alloy as optional. . All fan blades are factory balanced before shipped out. The fan is operating inside a fan stack enclosure to streamline the air entry while maintaining maximum fan efficiency.

The V belt drive system which connects the cast iron pulleys at the motor and fan is contained inside FRP belt cover. This is to ensure that the belts are protected from moist discharge air. Optional aluminium alloy pulleys are available.

The motor is of TEFC weather proof squirrel cage for 3 phase 415 V / 50 Hz power supply.

The motor shall be located outside the discharge air stream below the belt cover to prolong the motor life and ease of maintenance and access.

The fan bearing has a lubrication delivery system from external point outside the fan stack to the fan bearing to allow grease top up to be carried even when the fan is in operation.

Fills

The film type cellular fill is made of air vacuum forming Ultra Violet (UV) Light resistant PVC sheets which have corrugated surface. The surface has been specially designed to spread the water droplet from hot water basin evenly. The fills are arranged in a special hanging configuration where no adhesive bonding is used. The infills are hanged from the top with rail support structure and hold firmly at the bottom with another same rail structure.

The built in PVC drift eliminator on the infill itself can reduce the water loss due to carry over within 0.001% with very little air pressure drop.

Water distribution system

The hot water basin is open gravity type flow made from FRP material that is resistant to Ultra Violet (UV) Light and corrosion. The water is distributed via specially positioned holes in the basin onto a scattering bars below. These scattering bars will sprinkle the water effective and evenly on the fill section underneath.

COMPLETED **PROJECTS**

BOULEVARD KUCHING

KWSP SABAH

EMPIRE CITY

HILTON PUCHONG

MAHSA UNIVERSITY

KK2 PETRAJAYA KUCHING

WHEELOCK PLACE SINGAPORE

CENTARUS PAKISTAN

TECHNICAL DATA FOR **GKS SERIES**

Item			Model	1 Cell																		
				GKS 350-1B	GKS 400-1B	GKS 450-1B	GKS 500-1B	GKS 550-1B	GKS 600-1B	GKS 650-1B	GKS 700-1B	GKS 750-1B	GKS 800-1B	GKS 850-1B	GKS 900-1B	GKS 950-1B	GKS 1000-1B	GKS 1150-1B	GKS 1250-1B	GKS 1400-1B	GKS 1500-1B
Capacity	Cooling capacity	HRT		350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1150	1250	1400	1500
Overall Dimension	Width (W)	mm		5320			5440		5870		5870		6170		6170			6790		7240	
	Length (L)	mm		2620	2900		3260		3645		3645		3920		4220			4720		5420	
	Height (H)	mm		5040		5340	5890		5865		5575		5615		6370			7460		7850	
Components Material	Steel Structure			Hot Dip Galvanised Steel																	
	Casing			FRP																	
	Filler Media			PVC																	
	Distribution Basin			FRP																	
	Cold Water Basin			FRP																	
	Water Sump			FRP																	
	Fan Assembly			Hub : Aluminium Cast Alloy, Fan Blade : Aluminium Cast Alloy																	
	Fan Stack			FRP																	
Fan Assembly	Fan: Type			Axial Flow																	
	Fan: Diameter x Nos	mm		2400 x 1			2750 x 1		3050 x 1				3350 x 1		3650 x 1			4000 x 1		4250 x 1	
	Fan: Number of blades			6																	
	Fan: Fan speed (Approx.)	rpm		420	420	420	395	395	365	365	365	365	338	338	338	338	338	280	280	280	280
	Fan: Drive system			V-belt Drive System																	
	Motor: Type			Totally Enclosed Fan Cooled (TEFC) 3 Phase Induction Motor, 4 Pole																	
	Motor: Power source			3 Phase / 50Hz / 415 Volts																	
	Motor: Rated output x Qty (kw)			11 x 1	15 x 1	18.5 x 1	15 x 1	18.5 x 1	18.5 x 1	22 x 1	30 x 1	37 x 1		45 x 1	30 x 1	37 x 1	45 x 1	37 x 1	45 x 1		55 x 1
Inlet Distribution	Open Gravity Type			Open Gravity Type																	
Piping Dimension	Inlet, mm			150 x 2			200 x 2														
	Outlet,mm			200 x 1	250 x 1				300 x 1						300 x 1			350 x 1			
	Drain Pipe, mm			50 x 1																	
	Overflow, mm			80 x 1																	
	Auto Make-up, mm			50 x 1																	
	Manual make up, mm			50 x 1																	
Make up	Evaporation loss %			0.84																	
	Drift loss %			0.005																	
Weight	Dry	kg		3150	3850	3950	3720	3850	4180	4350	4650	4720	4950	5020	7250	7450	7650	8120	8250	8800	8920
	Operation	kg		8600	9680	9890	10800	10910	11900	11960	11980	12080	12900	12980	15500	15800	16200	20500	20800	25300	25800

1. The basic design condition of GKS series is based on hot water inlet 37°C, cold water outlet : 32°C, Ambient WB: 27°C, 13 l/min/HRT water flow rate
2. The pump head required is approximately the height at the cooling tower.
3. Manufacturer reserve the right to change the technical data for improvement of products without prior notice.

Item			Model	2 Cells																		
				GKS 700-2B	GKS 800-2B	GKS 900-2B	GKS 1000-2B	GKS 1100-2B	GKS 1200-2B	GKS 1300-2B	GKS 1400-2B	GKS 1500-2B	GKS 1600-2B	GKS 1700-2B	GKS 1800-2B	GKS 1900-2B	GKS 2000-2B	GKS 2300-2B	GKS 2500-2B	GKS 2800-2B	GKS 3000-2B
Capacity	Cooling capacity	HRT		700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2300	2500	2800	3000
Overall Dimension	Width (W)	mm		5320			5440		5870		5870		6170		6170			6790		7240	
	Length (L)	mm		5270	5830		6550		7320		7320		7870		8470			9470		10870	
	Height (H)	mm		5040		5340	5890		5865		5575		5615		6370			7460		7850	
Components Material	Steel Structure			Hot Dip Galvanised Steel																		
	Casing			FRP																		
	Filler Media			PVC																		
	Distribution Basin			FRP																		
	Cold Water Basin			FRP																		
	Water Sump			FRP																		
	Fan Assembly			Hub : Aluminium Cast Alloy, Fan Blade : Aluminium Cast Alloy																		
	Fan Stack			FRP																		
Fan Assembly	Fan	Type		Axial Flow																		
		Diameter x Nos	mm	2400 x 2			2750 x 2		3050 x 2				3350 x 2		3650 x 2			4000 x 2		4250 x 2		
		Number of blades		6																		
		Fan speed (Approx.)	rpm	420	420	420	395	395	365	365	365	365	338	338	338	338	338	280	280	280	280	
		Drive system		V-belt Drive System																		
	Motor	Type		Totally Enclosed Fan Cooled (TEFC) 3 Phase Induction Motor, 4 Pole																		
		Power source		3 Phase / 50Hz / 415 Volts																		
		Rated output x Qty (kw)		11 x 2	15 x 2	18.5 x 2	15 x 2	18.5 x 2	18.5 x 2	22 x 2	30 x 2	37 x 2		45 x 2	30 x 2	37 x 2	45 x 2	37 x 2	45 x 2		55 x 2	
Inlet Distribution	Open Gravity Type			Open Gravity Type																		
Piping Dimension	Inlet, mm			150 x 4			200 x 4															
	Outlet,mm			200 x 2	250 x 2				300 x 2						300 x 2			350 x 2				
	Drain Pipe, mm			50 x 2																		
	Overflow, mm			80 x 2																		
	Auto Make-up, mm			50 x 2																		
	Manual make up, mm			50 x 2																		
Make up	Evaporation loss %			0.84																		
	Drift loss %			0.005																		
Weight	Dry	kg		6300	7700	7900	7440	7700	8360	8700	9300	9440	9900	10040	14500	14900	15300	16240	16500	17600	17840	
	Operation	kg		17200	19360	19780	21600	21820	23800	23920	23960	24160	25800	25960	31000	31600	32400	41000	41600	50600	51600	

1. The basic design condition of GKS series is based on hot water inlet 37°C, cold water outlet : 32°C, Ambient WB: 27°C, 13 l/min/HRT water flow rate
2. The pump head required is approximately the height at the cooling tower.
3. Manufacturer reserve the right to change the technical data for improvement of products without prior notice.

Item			Model	3 Cells																		
				GKS 1050-3B	GKS 1200-3B	GKS 1350-3B	GKS 1500-3B	GKS 1650-3B	GKS 1800-3B	GKS 1950-3B	GKS 2100-3B	GKS 2250-3B	GKS 2400-3B	GKS 2550-3B	GKS 2700-3B	GKS 2850-3B	GKS 3000-3B	GKS 3450-3B	GKS 3750-3B	GKS 4200-3B	GKS 4500-3B
Capacity	Cooling capacity	HRT		1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700	2850	3000	3450	3750	4200	4500
Overall Dimension	Width (W)	mm		5320			5440		5870		5870		6170		6170			6790		7240	
	Length (L)	mm		7920	8760		9840		10995		10995		11820		12720			14220		16320	
	Height (H)	mm		5040		5340	5890		5865		5575		5615		6370			7460		7850	
Components Material	Steel Structure			Hot Dip Galvanised Steel																	
	Casing			FRP																	
	Filler Media			PVC																	
	Distribution Basin			FRP																	
	Cold Water Basin			FRP																	
	Water Sump			FRP																	
	Fan Assembly			Hub : Aluminium Cast Alloy, Fan Blade : Aluminium Cast Alloy																	
	Fan Stack			FRP																	
Fan Assembly	Fan	Type		Axial Flow																	
		Diameter x Nos	mm	2400 x 3			2750 x 3		3050 x 3				3350 x 3		3650 x 3			4000 x 3		4250 x 3	
		Number of blades		6																	
		Fan speed (Approx.)	rpm	420	420	420	395	395	365	365	365	365	338	338	338	338	338	280	280	280	280
		Drive system		V-belt Drive System																	
	Motor	Type		Totally Enclosed Fan Cooled (TEFC) 3 Phase Induction Motor, 4 Pole																	
		Power source		3 Phase / 50Hz / 415 Volts																	
		Rated output x Qty (kw)		11 x 3	15 x 3	18.5 x 3	15 x 3	18.5 x 3	18.5 x 3	22 x 3	30 x 3	37 x 3		45 x 3	30 x 3	37 x 3	45 x 3	37 x 3	45 x 3		55 x 3
Inlet Distribution	Open Gravity Type			Open Gravity Type																	
Piping Dimension	Inlet, mm			150 x 6			200 x 6														
	Outlet,mm			200 x 3	250 x 3				300 x 3						300 x 3			350 x 3			
	Drain Pipe, mm			50 x 3																	
	Overflow, mm			80 x 3																	
	Auto Make-up, mm			50 x 3																	
	Manual make up, mm			50 x 3																	
Make up	Evaporation loss %			0.84																	
	Drift loss %			0.005																	
Weight	Dry	kg		9450	11550	11850	11160	11550	12540	13050	13950	14160	14850	15060	21750	22350	22950	24360	24750	26400	26760
	Operation	kg		25800	29040	29670	32400	32730	35700	35880	35940	36240	38700	38940	46500	47400	48600	61500	62400	75900	77400

1. The basic design condition of GKS series is based on hot water inlet 37°C, cold water outlet : 32°C, Ambient WB: 27°C, 13 l/min/HRT water flow rate
2. The pump head required is approximately the height at the cooling tower.
3. Manufacturer reserve the right to change the technical data for improvement of products without prior notice.

Item \ Model				4 Cells																		
				GKS 1400-4B	GKS 1600-4B	GKS 1800-4B	GKS 2000-4B	GKS 2200-4B	GKS 2400-4B	GKS 2600-4B	GKS 2800-4B	GKS 3000-4B	GKS 3200-4B	GKS 3400-4B	GKS 3600-4B	GKS 3800-4B	GKS 4000-4B	GKS 4600-4B	GKS 5000-4B	GKS 5600-4B	GKS 6000-4B
Capacity	Cooling capacity	HRT	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200	3400	3600	3800	4000	4600	5000	5600	6000
Overall Dimension	Width (W)	mm	5320			5440		5870		5870		6170		6170			6790		7240	
	Length (L)	mm	10570	11690		13130		14670		14670		15770		16970			18970		21770	
	Height (H)	mm	5040		5340	5890		5865		5575		5615		6370			7460		7850	
Components Material	Steel Structure		Hot Dip Galvanised Steel																	
	Casing		FRP																	
	Filler Media		PVC																	
	Distribution Basin		FRP																	
	Cold Water Basin		FRP																	
	Water Sump		FRP																	
	Fan Assembly		Hub : Aluminium Cast Alloy, Fan Blade : Aluminium Cast Alloy																	
	Fan Stack		FRP																	
Fan Assembly – Fan	Type		Axial Flow																	
	Diameter x Nos	mm	2400 x 4			2750 x 4		3050 x 4				3350 x 4		3650 x 4			4000 x 4		4250 x 4	
	Number of blades		6																	
	Fan speed (Approx.)	rpm	420	420	420	395	395	365	365	365	365	338	338	338	338	338	280	280	280	280
	Drive system		V-belt Drive System																	
Fan Assembly – Motor	Type		Totally Enclosed Fan Cooled (TEFC) 3 Phase Induction Motor, 4 Pole																	
	Power source		3 Phase / 50Hz / 415 Volts																	
	Rated output x Qty (kw)		11 x 4	15 x 4	18.5 x 4	15 x 4	18.5 x 4	18.5 x 4	22 x 4	30 x 4	37 x 4		45 x 4	30 x 4	37 x 4	45 x 4	37 x 4	45 x 4		55 x 4
Inlet Distribution	Open Gravity Type		Open Gravity Type																	
Piping Dimension	Inlet, mm		150 x 8			200 x 8														
	Outlet,mm		200 x 4	250 x 4				300 x 4						300 x 4			350 x 4			
	Drain Pipe, mm		50 x 4																	
	Overflow, mm		80 x 4																	
	Auto Make-up, mm		50 x 4																	
	Manual make up, mm		50 x 4																	
Make up	Evaporation loss %		0.84																	
	Drift loss %		0.005																	
Weight	Dry	kg	12600	15400	15800	14880	15400	16720	17400	18600	18880	19800	20080	29000	29800	30600	32480	33000	35200	35680
	Operation	kg	34400	38720	39560	43200	43640	47600	47840	47920	48320	51600	51920	62000	63200	64800	82000	83200	101200	103200

1. The basic design condition of GKS series is based on hot water inlet 37°C, cold water outlet : 32°C, Ambient WB: 27°C, 13 l/min/HRT water flow rate
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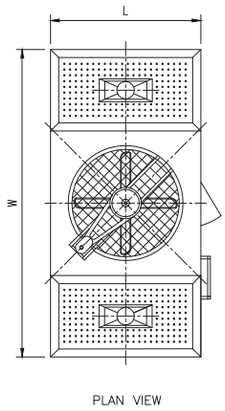
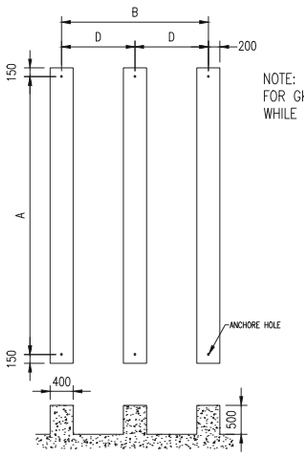
DESIGN OF **GKS SERIES**

GKS-1 CELL

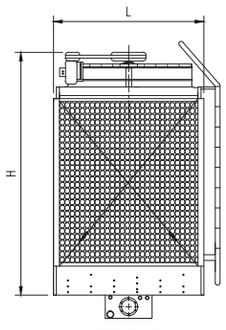


PLAN VIEW

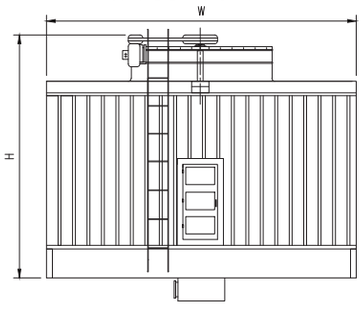


CONCRETE FOUNDATION

NOTE:
FOR GKS 350 TO GKS 450 ONLY USE 2 NOS OF PLINTH.
WHILE GKS 500 AND ABOVE WILL USE 3 NOS OF PLINTH.



FRONT VIEW

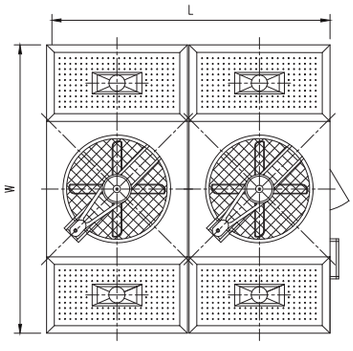


SIDE VIEW

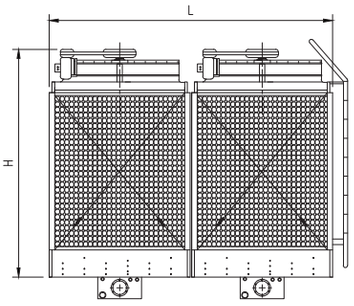
NOTE:ALL DIMENSION IN MM

MODEL	TOWER DIMENSION				FOUNDATION DETAILS		
	L	W	H	h	A	B	D
GKS 350-1B	2620	5320	5040	1060	5260	2560	–
GKS 400-1B	2900	5320	5040	1060	5260	2840	–
GKS 450-1B	2900	5320	5340	1060	5260	2840	–
GKS 500-1B	3260	5440	5890	1320	5380	3200	1600
GKS 550-1B	3260	5440	5890	1320	5380	3200	1600
GKS 600-1B	3645	5870	5865	1295	5810	3585	1793
GKS 650-1B	3645	5870	5865	1295	5810	3585	1793
GKS 700-1B	3645	5870	5575	1295	5810	3585	1793
GKS 750-1B	3645	5870	5575	1295	5810	3585	1793
GKS 800-1B	3920	6170	5615	1335	6110	3860	1930
GKS 850-1B	3920	6170	5615	1335	6110	3860	1930
GKS 900-1B	4220	6170	6370	1350	6110	4160	2080
GKS 950-1B	4220	6170	6370	1350	6110	4160	2080
GKS 1000-1B	4220	6170	6370	1350	6110	4160	2080
GKS 1150-1B	4720	6790	7460	1350	6730	4660	2330
GKS 1250-1B	4720	6790	7460	1350	6730	4660	2330
GKS 1400-1B	5420	7240	7850	1350	7180	5360	2680
GKS 1500-1B	5420	7240	7850	1350	7180	5360	2680

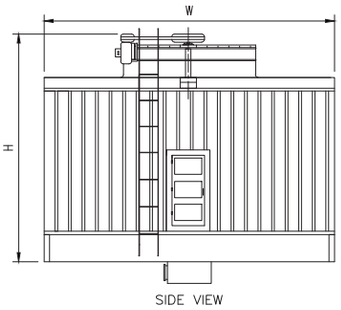
GKS-2 CELL



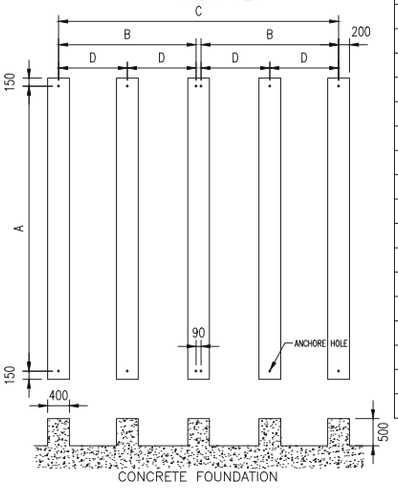
PLAN VIEW



FRONT VIEW



SIDE VIEW

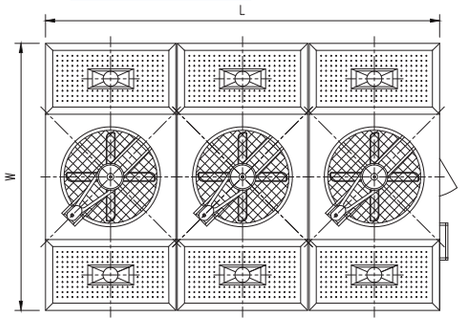


CONCRETE FOUNDATION

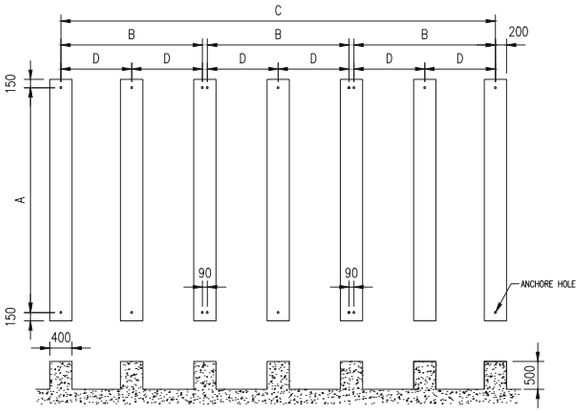
NOTE:ALL DIMENSION IN MM

MODEL	TOWER DIMENSION				FOUNDATION DETAILS			
	L	W	H	h	A	B	C	D
GKS 700-2B	5270	5320	5040	1060	5260	2560	5210	–
GKS 800-2B	5830	5320	5040	1060	5260	2840	5770	–
GKS 900-2B	5830	5320	5340	1060	5260	2840	5770	–
GKS 1000-2B	6550	5440	5890	1320	5380	3200	6490	1600
GKS 1100-2B	6550	5440	5890	1320	5380	3200	6490	1600
GKS 1200-2B	7320	5870	5865	1295	5810	3585	7260	1793
GKS 1300-2B	7320	5870	5865	1295	5810	3585	7260	1793
GKS 1400-2B	7320	5870	5575	1295	5810	3585	7260	1793
GKS 1500-2B	7320	5870	5575	1295	5810	3585	7260	1793
GKS 1600-2B	7870	6170	5615	1335	6110	3860	7810	1930
GKS 1700-2B	7870	6170	5615	1335	6110	3860	7810	1930
GKS 1800-2B	8470	6170	6370	1350	6110	4160	8410	2080
GKS 1900-2B	8470	6170	6370	1350	6110	4160	8410	2080
GKS 2000-2B	8470	6170	6370	1350	6110	4160	8410	2080
GKS 2300-2B	9470	6790	7460	1350	6730	4660	9410	2330
GKS 2500-2B	9470	6790	7460	1350	6730	4660	9410	2330
GKS 2800-2B	10870	7240	7850	1350	7180	5360	10810	2680
GKS 3000-2B	10870	7240	7850	1350	7180	5360	10810	2680

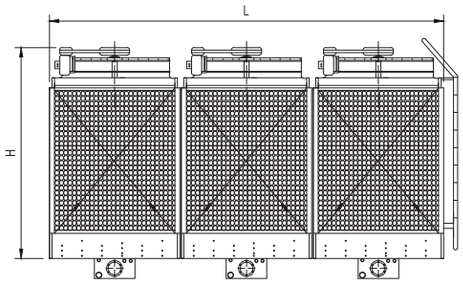
GKS-3 CELL



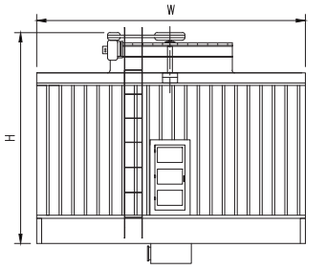
PLAN VIEW



CONCRETE FOUNDATION



FRONT VIEW

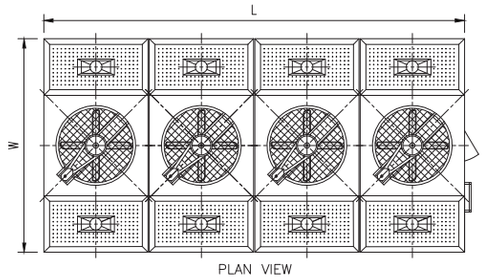


SIDE VIEW

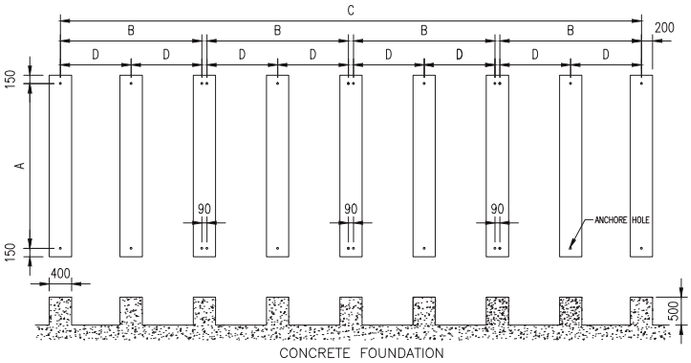
NOTE:ALL DIMENSION IN MM

MODEL	TOWER DIMENSION				FOUNDATION DETAILS			
	L	W	H	h	A	B	C	D
GKS 1050-3B	7920	5320	5040	1060	5260	2560	7860	–
GKS 1200-3B	8760	5320	5040	1060	5260	2840	8700	–
GKS 1350-3B	8760	5320	5340	1060	5260	2840	8700	–
GKS 1500-3B	9840	5440	5890	1320	5380	3200	9780	1600
GKS 1650-3B	9840	5440	5890	1320	5380	3200	9780	1600
GKS 1800-3B	10995	5870	5865	1295	5810	3585	10935	1793
GKS 1950-3B	10995	5870	5865	1295	5810	3585	10935	1793
GKS 2100-3B	10995	5870	5575	1295	5810	3585	10935	1793
GKS 2250-3B	10995	5870	5575	1295	5810	3585	10935	1793
GKS 2400-3B	11820	6170	5615	1335	6110	3860	11760	1930
GKS 2550-3B	11820	6170	5615	1335	6110	3860	11760	1930
GKS 2700-3B	12720	6170	6370	1350	6110	4160	12660	2080
GKS 2850-3B	12720	6170	6370	1350	6110	4160	12660	2080
GKS 3000-3B	12720	6170	6370	1350	6110	4160	12660	2080
GKS 3450-3B	14220	6790	7460	1350	6730	4660	14160	2330
GKS 3750-3B	14220	6790	7460	1350	6730	4660	14160	2330
GKS 4200-3B	16320	7240	7850	1350	7180	5360	16260	2680
GKS 4500-3B	16320	7240	7850	1350	7180	5360	16260	2680

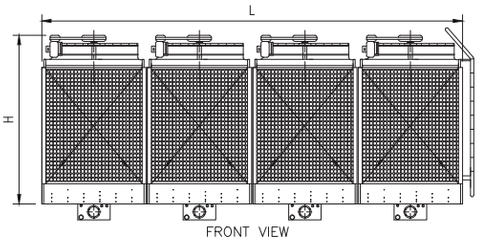
GKS-4 CELL



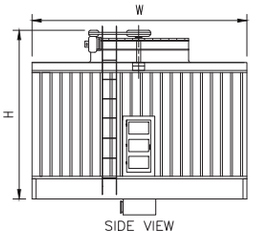
PLAN VIEW



CONCRETE FOUNDATION



FRONT VIEW



SIDE VIEW

NOTE:ALL DIMENSION IN MM

MODEL	TOWER DIMENSION				FOUNDATION DETAILS			
	L	W	H	h	A	B	C	D
GKS 1400-4B	10570	5320	5040	1060	5260	2560	10510	–
GKS 1600-4B	11690	5320	5040	1060	5260	2840	11630	–
GKS 1800-4B	11690	5320	5340	1060	5260	2840	11630	–
GKS 2000-4B	13130	5440	5890	1320	5380	3200	13070	1600
GKS 2200-4B	13130	5440	5890	1320	5380	3200	13070	1600
GKS 2400-4B	14670	5870	5865	1295	5810	3585	14610	1793
GKS 2600-4B	14670	5870	5865	1295	5810	3585	14610	1793
GKS 2800-4B	14670	5870	5575	1295	5810	3585	14610	1793
GKS 3000-4B	14670	5870	5575	1295	5810	3585	14610	1793
GDS 3200-4B	15770	6170	5615	1335	6110	3860	15710	1930
GDS 3400-4B	15770	6170	5615	1335	6110	3860	15710	1930
GDS 3600-4B	16970	6170	6370	1350	6110	4160	16910	2080
GDS 3800-4B	16970	6170	6370	1350	6110	4160	16910	2080
GDS 4000-4B	16970	6170	6370	1350	6110	4160	16910	2080
GDS 4600-4B	18970	6790	7460	1350	6730	4660	18910	2330
GDS 5000-4B	18970	6790	7460	1350	6730	4660	18910	2330
GDS 5600-4B	21770	7240	7850	1350	7180	5360	21710	2680
GDS 6000-4B	21770	7240	7850	1350	7180	5360	21710	2680

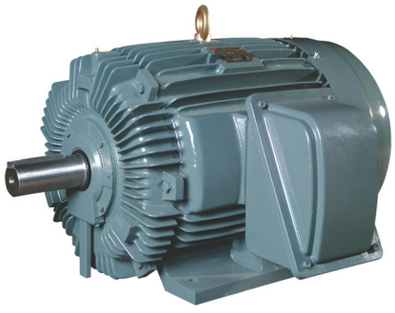
SPECIAL **OPTIONS**

GEAR REDUCER

In addition to using V belt, right angle reduction gears are used for stringer application that requires no down time due to wear and tear. This type of option gives the building owner the convenience of planning the down time for planned maintenance. Design features and ratings are in accordance with the minimum requirements of AGMA (American Gear Manufacturers Association) and CTI (Cooling Technology Institute) standards.

HANDRAIL

The safety option is to ensure that working at elevated height of cooling tower is now complete with guard rail around the tower parameters. This option can be further enhanced with caged ladder which is an add feature as well.



HIGH EFFICIENCY MOTOR

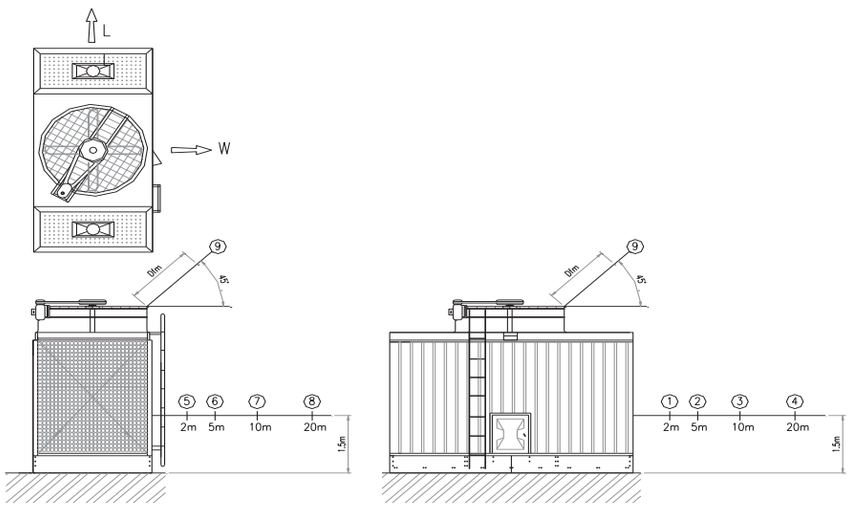
Our high efficiency motor are rated to Eff2 or IE1 (standard) , Eff1 and IE2 (high efficiency). We also offer latest IE3 (premium) standards as indicated by IEC 60034-30. The choice of efficiency is up the client's preferences. For usage with variable speed inverters, we recommend special modification to the motor is required in order to allow the motor to operate at low frequency.

DISCHARGE HOOD

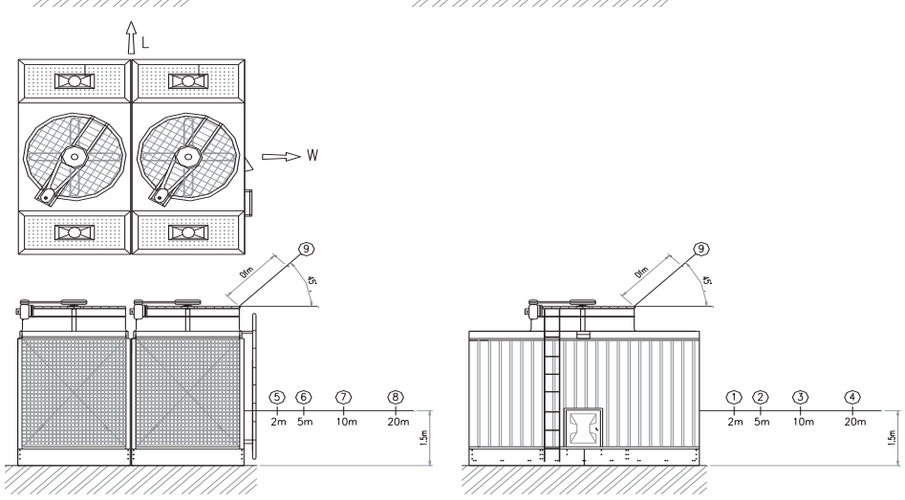
This option gives alternative diversion of hot air discharge from the fan stack to other direction deem more suitable. It is made from Fibreglass Reinforced Polyester (FRP) which is the same material as the fan stack. The most popular discharge angle is 45°.

NOISE DATA OF **GKS SERIES**

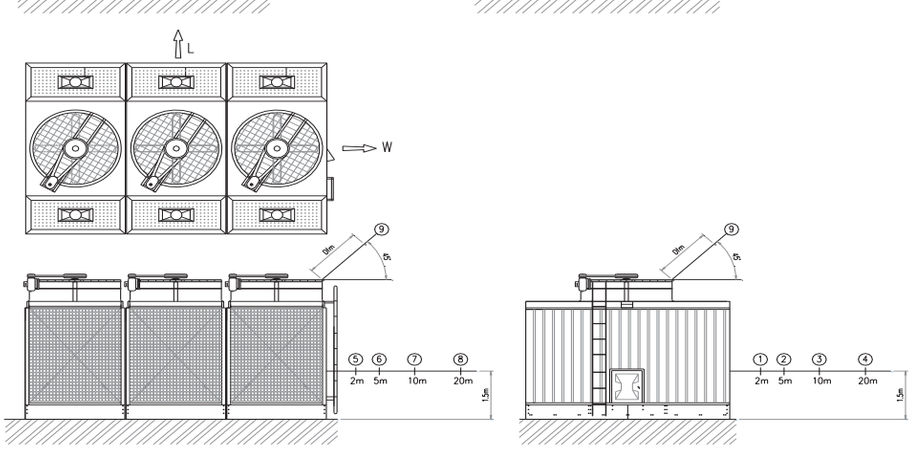
GKS-1 CELL



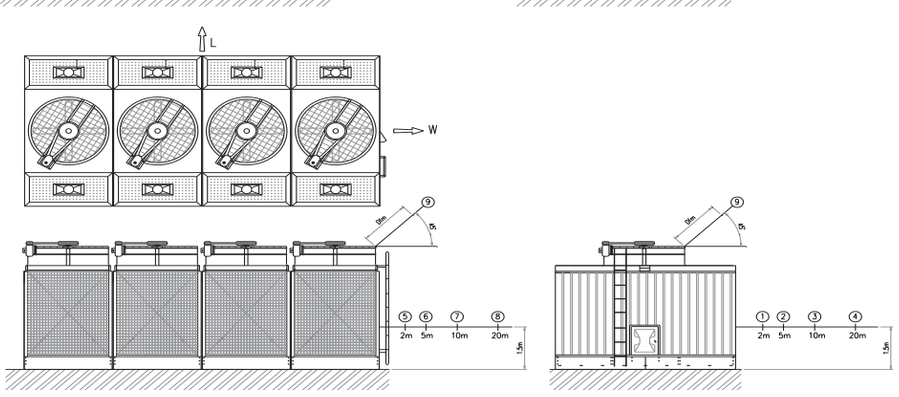
GKS-2 CELL



GKS-3 CELL



GKS-4 CELL



	Model	SOUND LEVEL dB(A)								
		Louver (L)				Panel (W)				FAN (Dfm) (45°)
		①	②	③	④	⑤	⑥	⑦	⑧	⑨
GKS-1 CELL	GKS350-1B	71.5	67	62	57	68.5	64	59	55	74
	GKS400-1B	73	69	64	59	70	65	61	56	75
	GKS450-1B	74	70	65	60	71	66	62	57	76
	GKS500-1B	75	71	65.5	61	72	67.5	63.5	58	76
	GKS525-1B	75.5	72	66	62	73	68.5	64	58.5	76.5
	GKS550-1B	77	73	66.5	62.5	74	69	64.5	59.5	77
	GKS600-1B	79	73.5	67	63	74.5	69.5	65	60	77
	GKS625-1B	79.5	74	67.5	63.5	75	70	66	61	78
	GKS650-1B	80	74.5	68	64	75.5	70.5	66.5	61.5	78
	GKS700-1B	80	75	68.5	65	76	71	67	62	79.5
	GKS750-1B	81	75.5	69	65.5	76.5	72	68	63	80
	GKS800-1B	81	76	69.5	66	76.5	72.5	68.5	63.5	81
	GKS850-1B	81.5	76.5	70	66.5	77	73	69	64.5	82
	GKS900-1B	82	77	71	67	78	74	69.5	65	82
	GKS950-1B	82	77.5	71.5	67.5	78.5	74.5	70	65.5	82.5
	GKS1000-1B	82.5	78	72	68	79	75	71	66	83
	GKS1150-1B	83	78.5	72.5	68.5	79.5	75.5	72	66.5	83.5
	GKS1250-1B	83	79	73	69	79.5	76	72.5	67	84
	GKS1400-1B	84	79.5	74	70	80	76.5	73	67.5	84
	GKS1500-1B	84	80	75	71	80	77	73.5	68	84.5
GKS-2 CELL	GKS700-2B	75	69	64	60	70	64	59.5	56	78
	GKS800-2B	76	70	65.5	61	71	65	61.5	56.5	78.5
	GKS900-2B	78	72	66	62	71	66.5	62.5	57	79
	GKS1000-2B	79	74	68	63	71	67.5	63.5	58	79
	GKS1050-2B	79.5	74	69	63.5	73	68.5	64	58.5	80
	GKS1100-2B	80.5	74.5	69.5	64	74	69.5	64.5	59.5	81
	GKS1200-2B	82	78	68	65	75	70	65	60	81
	GKS1250-2B	82.5	78.5	69	65.5	75	70.5	65.5	61	81.5
	GKS1300-2B	83	79	69.5	66	76	71	66.5	62	82
	GKS1400-2B	83	79	70.5	66.5	76	71.5	67.5	62.5	82
	GKS1500-2B	84	79.5	70.5	67	76.5	72	68	63	82.5
	GKS1600-2B	84.5	80	70.5	66.5	77	73	68.5	64	82.5
	GKS1700-2B	84.5	80.5	71	67	77	73.5	69.5	64.5	83
	GKS1800-2B	85	81	71.5	67.5	78	74	69.5	65.5	83
	GKS1900-2B	85	81	72	68	78.5	74.5	70	66	84
	GKS2000-2B	85.5	81.5	72.5	68.5	79.5	75.5	71	66.5	85
	GKS2300-2B	86	82	73	69	79.5	76	72.5	67	86
	GKS2500-2B	86	82.5	73.5	70	80.5	76.5	73	67.5	86.5
	GKS2800-2B	87.5	83	74.5	71	80.5	77	73	68	87
	GKS3000-2B	87.5	83.5	75	71.5	80.5	77.5	74	68.5	87
GKS-3 CELL	GKS1050-3B	77	70	65	61	71	64.5	60	56.5	80
	GKS1200-3B	78	72	66	62	72	65	62	57	80.5
	GKS1350-3B	78.5	73	67	63	72	67	62.5	57.5	81
	GKS1500-3B	79.5	75	68.5	64	72	67.5	63.5	58	81
	GKS1575-3B	80	75.5	70	64.5	72	68.5	64	58.5	81.5
	GKS1650-3B	81	75.5	70.5	65	73	70	64.5	59.5	82
	GKS1800-3B	82.5	78.5	69	66	74.5	70.5	66	60	82
	GKS1875-3B	84	79	70	67	75	70.5	66	61.5	82.5
	GKS1950-3B	84.5	80	71	65.5	75.5	71	66.5	62.5	83
	GKS2100-3B	85	80	72	67	77	71.5	67.5	63	83
	GKS2250-3B	85.5	78	72	68	77.5	72.5	68	63.5	83.5
	GKS2400-3B	86	79.5	70.5	68.5	77.5	72	69	64.5	83.5
	GKS2550-3B	86.5	81	72	67	77.5	73	69.5	65	84
	GKS2700-3B	86	82	72.5	68	78.5	73.5	69.5	66	84
	GKS2850-3B	87	82	73	69	79	74.5	70	66.5	84.5
	GKS3000-3B	87.5	82.5	73.5	69.5	79.5	75.5	71	67	86
	GKS3450-3B	88	83	74	70	80	76.5	72.5	67	86.5
	GKS3750-3B	88	84	74.5	70.5	80.5	77	73.5	67.5	87
	GKS4200-3B	87	84	75	71.5	81	77.5	73.5	68.5	87.5
	GKS4500-3B	87.5	85	76	72	81	77.5	74.5	69	88
GKS-4 CELL	GKS1400-4B	78	71	66	62.5	72.5	66	60.5	57	81
	GKS1600-4B	79	73	67	63	73.5	66.5	62	57.5	81.5
	GKS1800-4B	79.5	73.5	68	64.5	73.5	67.5	62.5	57.5	81.5
	GKS2000-4B	81	75.5	69.5	65	74	68	63	58	82
	GKS2100-4B	82	76	71	66.5	74	69	64	58.5	82
	GKS2200-4B	83	76.5	71	67.5	74.5	70.5	64.5	59	82.5
	GKS2400-4B	84.5	77	68	67.5	75.5	71	66.5	60	83
	GKS2500-4B	85.5	78.5	70.5	69	76.5	72	66.5	62	84
	GKS2600-4B	86	80.5	71.5	67	78	72.5	67	62.5	83.5
	GKS2800-4B	87	81	72.5	68	77	72.5	67.5	63	83.5
	GKS3000-4B	87.5	79.5	73	69	78.5	74	68.5	63.5	84
	GKS3200-4B	86	81.5	70.5	70	79	71	70	64.5	84
	GKS3400-4B	86.5	82	71	68.5	79.5	72	69.5	65	85
	GKS3600-4B	87	83	72.5	69.5	79.5	74	69.5	65.5	85
	GKS3800-4B	87.5	83	74	70.5	80	75	70.5	66	85.5
	GKS4000-4B	88	83.5	74	71	80.5	76	71	67	86.5
	GKS4600-4B	87	84	74.5	70	81	77	71.5	67.5	87
	GKS5000-4B	87.5	85	75	71	82	78.5	72	67.5	87.5
	GKS5600-4B	88	85	76	72	82.5	78.5	73	68	88
	GKS6000-4B	88.5	86	77	72.5	82.5	79	73.5	68.5	89

CALCULATION OF **MAKE UP WATER**

1. Evaporating Loss (E) kg/h

The evaporating quantity may be calculated by the equation below.

$$E = \frac{Q}{600} = \frac{(T1-T2)}{600} \times WF \times C$$

Where WE :Evaporating Quantity kg/h
Q :Heat of Cooling Kcal/h
600 : Latent Heat of Water Kcal/kg ° C
T1 : Intake Water Temperature °C
T2 : Discharge water Temperature °C
WF : Circulating Water Flow kg/h
C : Specific Heat of Water 1 Kcal/kg °C

2. Drift Loss (D) kg/h

The drift loss (D) depend on the type of cooling tower and drift eliminators used. Due to the air flow at a certain speed created by the fan, some water droplets are carried away with the air, this is called carry-over loss.

There are many factors affecting the figure and this generally at a low level, approximately 0.01 % of the normal circulating water quantity.

3. Blowdown Quantity (B) kg/h

The blow-down (B) can be carried out in any of the following methods

(1) The drain valve is kept slightly open during the run.
(2) Maintain the operating water level higher to create slight overflow
(3) The whole basin water is replenished with fresh water during shut down for cleaning

The required level of blowdown varies depending on the water quantity or the extent of concentrations, but is generally believed to be about 0.2% to 0.4 % for air conditioning applications.

4. Replenishing Water Flow rate (R) kg/h

R = E + D +B

Eg: Evaporation loss : E = 0.98%
Drift loss : D = 0.01%
Blow-down : B = 0.4%

Therefore, the make-up water required is approximately
= 0.98% + 0.01% + 0.4%
= 1.39%

Hence, considering safety margin, a make up of 2 % of the circulating water flow rate is sufficient.

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