

GENIUS

GD/GDS SERIES COUNTERFLOW 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

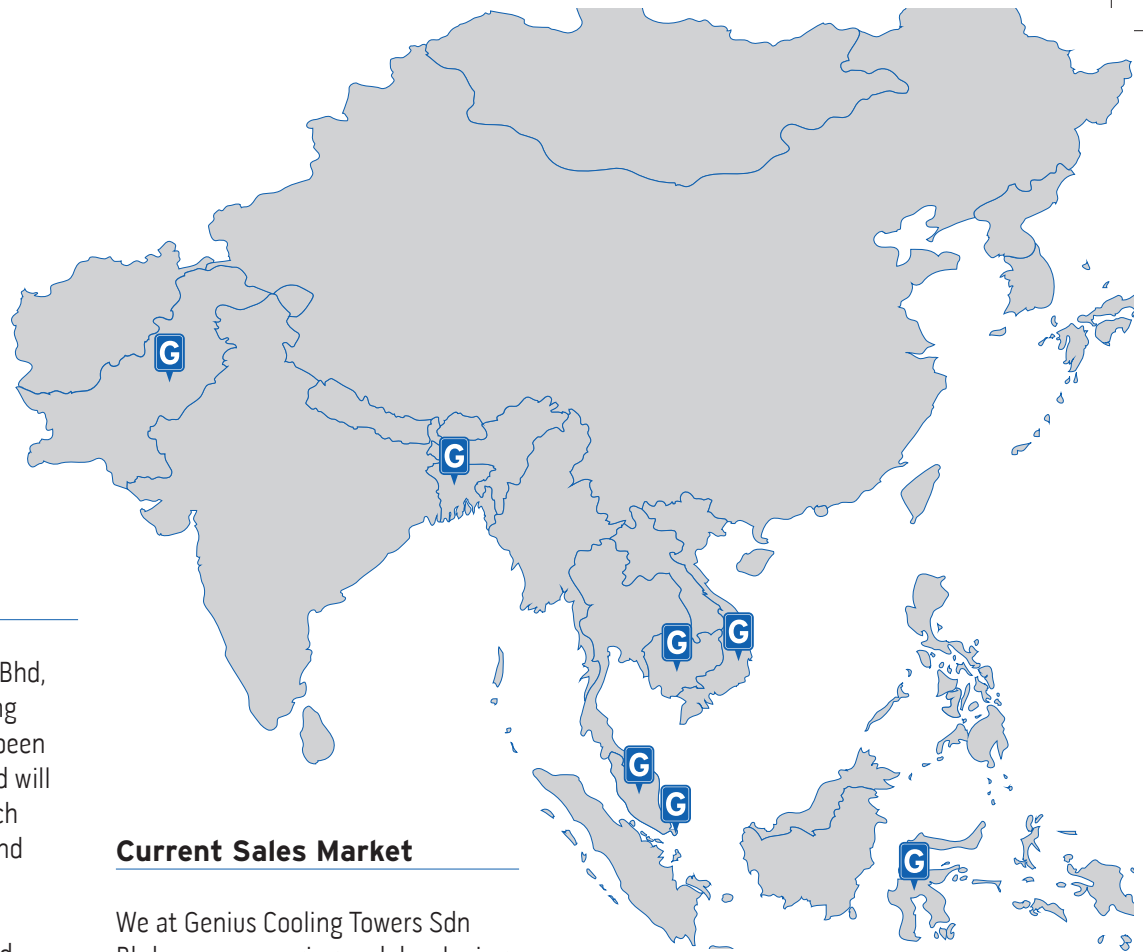


Genius Cooling Tower CTI test facility

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™ GD / GDS SERIES COOLING TOWER

GD and GDS Series Quick Selection Table

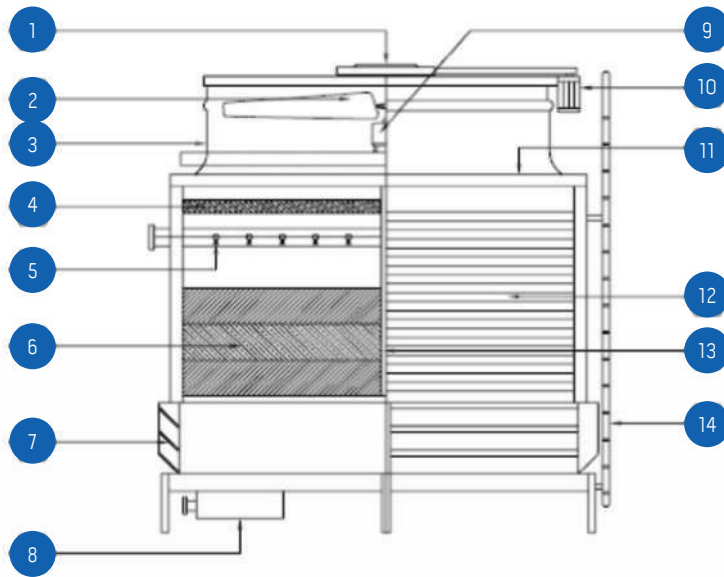
The diagrams below show the common combinations of various cold water, hot water, wet bulb temperature. However, if there is a difference in temperature combination, please contact the company for a selection of the cooling tower for one cell tower by our computer software.

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												
GD 50	50	93	83	79	172	110	119	121	163	106	148	152	139	128
GD 60	60	111	100	95	206	132	143	145	196	127	177	182	167	153
GD 70	70	130	117	111	241	154	167	170	228	148	207	213	194	179
GD 80	80	148	134	126	275	176	190	194	261	169	236	243	222	204
GD 100	100	185	167	158	344	220	238	242	326	211	295	304	278	256
GD 125	125	233	209	198	432	264	300	304	410	264	370	379	344	322
GD 150	150	278	251	236	515	317	357	366	489	317	445	458	414	388
GD 175	175	330	293	277	604	383	419	427	573	374	520	529	480	449
GD 200	200	379	333	317	687	441	476	485	652	427	595	608	551	511
GD 225	225	419	376	356	775	485	537	551	736	476	670	683	621	573
GD 250	250	471	418	396	859	537	595	608	815	529	740	758	692	643
GD 280	280	518	468	443	962	617	666	678	913	592	826	851	777	715
GD 300	300	555	502	475	1031	661	714	731	978	639	890	916	828	775
GD 325	325	601	543	514	1117	716	773	787	1060	687	959	988	902	830
GD 350	350	661	586	554	1203	767	833	855	1145	740	1040	1057	969	899
GD 400	400	762	666	634	1383	881	952	969	1304	850	1189	1216	1106	1022
GD 450	450	837	752	712	1555	969	1070	1101	1471	956	1339	1366	1242	1145
GD 500	500	943	836	792	1718	1101	1189	1216	1630	1062	1485	1520	1383	1304
GD 560	560	1036	936	886	1924	1233	1332	1357	1826	1184	1652	1702	1554	1431
GD 600	600	1110	1004	950	2062	1322	1427	1454	1956	1278	1784	1824	1661	1542
GD 650	650	1203	1086	1028	2233	1432	1546	1575	2119	1374	1918	1976	1804	1661
GD 700	700	1322	1171	1108	2405	1542	1665	1696	2282	1489	2084	2115	1934	1797
GD 750	750	1414	1254	1188	2577	1612	1806	1824	2445	1586	2220	2273	2075	1930
GD 800	800	1520	1332	1268	2749	1762	1903	1938	2608	1700	2379	2432	2211	2044
GD 840	840	1554	1404	1329	2886	1850	1998	2035	2738	1776	2478	2553	2331	2146
GD 900	900	1696	1504	1424	3093	1982	2141	2181	2943	1912	2678	2731	2489	2291
GD 1000	1000	1885	1672	1584	3436	2203	2379	2423	3260	2123	2974	3040	2767	2573
GDS 350-1B	350	661	586	554	1203	767	883	855	1145	740	1040	1057	969	899
GDS 400-1B	400	762	666	634	1383	881	952	969	1304	850	1189	1216	1106	1022
GDS 450-1B	450	837	752	712	1555	969	1070	1101	1471	956	1339	1366	1242	1145
GDS 500-1B	500	943	836	792	1718	1101	1189	1216	1630	1062	1485	1520	1383	1304
GDS 550-1B	550	1030	920	871	1890	1218	1308	1318	1775	1168	1665	1661	1551	1427
GDS 600-1B	600	1110	999	951	2062	1322	1427	1454	1956	1278	1784	1824	1661	1542
GDS 650-1B	650	1203	1086	1028	2233	1432	1546	1575	2119	1374	1918	1976	1804	1661
GDS 700-1B	700	1322	1171	1108	2405	1542	1665	1696	2282	1489	2084	2115	1934	1797
GDS 750-1B	750	1414	1254	1188	2577	1612	1806	1824	2445	1586	2220	2273	2075	1930
GDS 800-1B	800	1520	1332	1268	2749	1762	1903	1938	2608	1700	2379	2432	2211	2044
GDS 850-1B	850	1628	1421	1346	2921	1878	2018	2038	2753	1815	2599	2581	2423	2188
GDS 900-1B	900	1696	1504	1424	3093	1982	2141	2181	2943	1912	2678	2731	2489	2291
GDS 950-1B	950	1813	1590	1505	3264	2093	2261	2318	3075	2038	2890	2881	2687	2476
GDS 1000-1B	1000	1885	1672	1584	3436	2203	2379	2423	3260	2123	2974	3040	2767	2573
GDS 1150-1B	1150	2219	1924	1821	3952	2542	2738	2768	3688	2448	3465	3445	3232	2999
GDS 1250-1B	1250	2355	2090	1980	4295	2685	2975	3040	4075	2645	3700	3790	3460	3215
GDS 1400-1B	1400	2644	2342	2216	4810	3084	3330	3392	4564	2978	4168	4230	3868	3594
GDS 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 DRIFT ELIMINATOR
- 5 NON-CLOG SPRAY NOZZLE
- 6 HIGH PERFORMANCE FILM FILL PACK
- 7 LOUVER
- 8 COLD WATER BASIN SUMP
- 9 GEAR REDUCER SYSTEM
- 10 MOTOR
- 11 SAFETY MAINTENANCE SYSTEM
- 12 CASING
- 13 MAIN FRAME STRUCTURE
- 14 LADDER

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 bonded into modular blocks and install in the tower as per design.

The specially designed PVC drift eliminator can reduce the water loss due to carry over within 0.001% with very little air pressure drop.

Water distribution system

All nozzles are designed to be with special orifice to avoid getting clogged easily. Moreover the nozzles are located inside the tower therefore it is not expose to dirt and environmental pollution.

COMPLETED PROJECTS



HITACHI BANGI



SUBANG PARADE



HOLIDAY INN JOHOR



AEON MELAKA



WISMA NEGERI TERENGGANU



SUNRUBBER, SENAWANG

IPKB, SETIA ALAM - 9,000 HRT installation
1st quarter 2015

TECHNICAL DATA FOR GD SERIES

Item		Model	1 Cell															
			GD50	GD60	GD70	GD80	GD100	GD125	GD150	GD175	GD200	GD225	GD250	GD280	GD300	GD325		
Capacity	Cooling capacity	HRT	50	60	70	80	100	125	150	175	200	225	250	280	300	325		
	Water flow rate	m ³ /hr	27	33	38	44	78	98	117	137	156	176	195	218	234	254		
	Hot water temp.	°C	37															
	Cold water temp.	°C	32															
	Wet bulb temp.	°C	27															
Overall dimension	Width (W)	mm	1600			1800			2150			2750			3150		3350	
	Length (L)	mm	1600			1800			2150			2750			3150		3350	
	Total height	mm	3345	3690	3890	3905	3930	4285	4310	4310	4670	4670		5100	5360	5100		
Material	Casing		FRP															
	Framework		Hot-Dip Galvanized Steel															
	Fill		PVC															
	Drift eliminator		PVC															
	Distribution pipe / nozzle		PVC / Polypropylene															
	Cold water basin		FRP															
	Fan Assembly		Hub: Cast Aluminium Alloy, Blade: FRP/Cast Aluminium Alloy															
Fan cylinder		FRP																
Fan	Type		Axial Flow															
	Diameter	mm	1200	1300	1300	1300	1500	1700	1800			2000			2180	2750	2400	
	Number of blades		4	4	4	4	4	4	4			4			4	6	6	
	Fan speed	rpm	960	960	960	620	620	475	475	480	420	420	420	420	380	420		
Motor	Drive system		Direct Drive					V-Belt and Pulley										
	Type		TEAO / 6 poles					Totally enclosed fan cooled 3 phase induction motor, 4 poles										
	Power source		415V/3Ph/50Hz															
	Rated output	kw	1.1	1.5	1.5	2.2	3	3.7	3.7	5.5	5.5	5.5	7.5	7.5	7.5	11		
	Quantity		1															
Distribution System			PVC distribution pipe and lateral tubes equipped with polypropylene spray nozzles															
Piping diameter	Inlet pipe dia.		80 x 1	80 x 1	100 x 1	100 x 1	100 x 1	125 x 1	125 x 1	150 x 1	150 x 1	200 x 1	200 x 1	200 x 1	200 x 1	200 x 1		
	Outlet pipe dia.		80 x 1	80 x 1	100 x 1	100 x 1	100 x 1	125 x 1	125 x 1	150 x 1	150 x 1	200 x 1	200 x 1	200 x 1	200 x 1	200 x 1		
	Drain pipe		50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1		
	Overflow pipe		50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1		
	Auto make up pipe		25 x 1	25 x 1	25 x 1	25 x 1	25 x 1	25 x 1	25 x 1	25 x 1	25 x 1	32 x 1	32 x 1	40 x 1	40 x 1	40 x 1		
	Manual make up pipe		25 x 1	25 x 1	25 x 1	25 x 1	25 x 1	25 x 1	25 x 1	25 x 1	25 x 1	32 x 1	32 x 1	40 x 1	40 x 1	40 x 1		
Make-up	Evaporation loss	%	0.84															
	Drift loss	%	0.005															
Weight	Dry weight	kg	850	870	890	910	1050	1080	1530	1590	1650	1940	2080	2480	2670	2880		
	Operating weight	kg	1880	1940	1990	2030	2830	2950	3850	3980	4280	4780	4890	5550	5680	5930		
Internal head loss		m	3345	3690	3890	3905	3930	4285	4310	4310	4670	4670	4670	5100	5360	5100		
Water storage capacity		litres	1030	1070	1100	1120	1780	1870	2320	2390	2630	2840	2810	3070	3010	3050		

The basic design condition of GD 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
 Manufacturer reserve the right to change the technical data for improvement of products without prior notice.

Item		Model	2 Cells						3 Cells					4 Cells					
			GD350	GD400	GD450	GD500	GD560	GD600	GD650	GD700	GD750	GD800	GD840	GD900	GD1000	GD1120	GD1200	GD1300	
Capacity	Cooling capacity	HRT	350	400	450	500	560	600	650	700	750	800	840	900	1000	1120	1200	1300	
	Water flow rate	m ³ /hr	191	218	245	272	305	327	354	381	409	436	458	490	545	610	654	708	
	Hot water temp.	°C	37																
	Cold water temp.	°C	32																
	Wet bulb temp.	°C	27																
Overall dimension	Width (W)	mm	2750		3150		3350			3150		3350			3150	3350			
	Length (L)	mm	5500		6300			6700			9450		10050			12600	13400		
	Total height	mm	4310	4670	4670		5100	5360	5100	4670		4670	5100	5360	4670	5100	5360	5100	
Material	Casing		FRP																
	Framework		Hot Dipped Galvanised Steel																
	Fill		PVC																
	Drift eliminator		PVC																
	Distribution pipe / nozzle		PVC/Polypropylene																
	Cold water basin		FRP																
	Fan Assembly		Hub: Cast Aluminium Alloy, Blade: FRP/Cast Aluminium Alloy																
	Fan cylinder		FRP																
Fan	Type		Axial Flow																
	Diameter	mm	1800 x 2	2000 x 2	2000 x 2	2000 x 2	2180 x 2	2750 x 2	2400 x 2	2000 x 3	2000 x 3	2000 x 3	2180 x 3	2750 x 3	2000 x 4	2180 x 4	2750 x 4	2400 x 4	
	Number of blades		4	4	4	4	4	6	6	4	4	4	4	6	4	4	6	6	
	Fan speed	rpm	480	480	480	480	420	380	420	480	480	480	480	380	420	475	380	420	
Motor	Drive system		V-belt Drive System																
	Type		415V/3Ph/50Hz																
	Power source		Totally enclosed fan cooled 3 phase induction motor, 4 poles																
	Rated output	kw	5.5	5.5	5.5	7.5	7.5	7.5	11	5.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	11	
	Quantity		2	2	2	2	2	2	2	3	3	3	3	3	4	4	4	4	
Distribution System			PVC distribution pipe and lateral tubes equipped with polypropylene spray nozzles																
Piping diameter	Inlet pipe dia.	mm	150 x 2	150 x 2	200 x 2	200 x 2	200 x 2	200 x 2	200 x 2	200 x 3	200 x 3	200 x 3	200 x 3	200 x 3	200 x 4	200 x 4	200 x 4	200 x 4	
	Outlet pipe dia.	mm	200 x 1	250 x 1	250 x 1	250 x 1	250 x 1	250 x 1	250 x 1	200 x 2	200 x 2	250 x 2	250 x 2	250 x 2	250 x 2	250 x 2	250 x 2	250 x 2	
	Drain pipe	mm	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	
	Overflow pipe	mm	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	
	Auto make up pipe	mm	40 x 1	50 x 1	50 x 1	50 x 1	40 x 1	40 x 1	40 x 1	40 x 2	40 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	
	Manual make up pipe	mm	40 x 1	50 x 1	50 x 1	50 x 1	40 x 1	40 x 1	40 x 1	40 x 2	40 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	
Make-up	Evaporation loss	%	0.84																
	Drift loss	%	0.005																
Weight	Dry weight	kg	3180	3300	3880	4160	4960	5340	5760	6048	6240	6550	7440	8010	8320	9920	10680	11520	
	Operating weight	kg	7960	8560	9560	9780	11100	11360	11860	12450	14670	15500	16650	17040	19560	22200	22720	23720	
Internal head loss		m	4310	4670	4670	4670	5100	5360	5100	4670	4670	4670	5100	5360	4670	5100	5360	5100	
Water storage capacity		litres	4780	5260	5680	5620	6140	6020	6100	6402	8430	8950	9210	9030	11240	12280	12040	12200	

The basic design condition of GD 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
Manufacturer reserve the right to change the technical data for improvement of products without prior notice.

TECHNICAL DATA FOR GDS SERIES

Item		Model	1 Cell								
			GDS350-1B	GDS400-1B	GDS450-1B	GDS500-1B	GDS550-1B	GDS600-1B	GDS650-1B	GDS700-1B	GDS750-1B
Capacity	Cooling capacity	HRT	350	400	450	500	550	600	650	700	750
	Water flow rate	m ³ /hr	273	312	351	390	429	468	507	546	585
	Hot water temp.	°C	37								
	Cold water temp.	°C	32								
	Wet bulb temp.	°C	27								
Overall dimension	Width (W)	mm	3550		3950	4350		4800	5100	5400	
	Length (L)	mm	3550		3950	4350		4800	5100	5400	
	Total height	mm	5095	5355	5380	5430		5730	5770		5785
Material	Casing		FRP								
	Framework		Hot-Dip Galvannized Steel								
	Fill		PVC								
	Drift eliminator		PVC								
	Distribution pipe / nozzle		PVC / Polypropylene								
	Cold water basin		FRP								
	Fan Assembly		Hub: Cast Aluminium Alloy, Blade: Cast Aluminium Alloy								
	Fan cylinder		FRP								
Fan	Type		Axial Flow								
	Diameter	mm	2400 x 1	2750 x 1	3050 x 1	3050 x 1	3050 x 1	3050 x 1	3350 x 1	3350 x 1	3650 x 1
	Number of blades		6								
	Fan speed	rpm	420	395	365	365	365	365	338	338	320
Motor	Drive system		V-Belt and Pulley (Option: Gear Drive)								
	Type		Totally enclosed fan cooled 3 phase induction motor, 4 poles								
	Power source		415V/3Ph/50Hz								
	Rated output	kw	11	15	15	15	18.5	18.5	18.5	22	22
	Quantity		1								
Distribution System			PVC distribution pipe and lateral tubes equipped with polypropylene spray nozzles								
Piping diameter	Inlet pipe dia.		200 x 1	200 x 1	200 x 1	250 x 1	250 x 1	250 x 1	250 x 1	250 x 1	250 x 1
	Outlet pipe dia.		200 x 1	250 x 1	250 x 1	250 x 1	250 x 1	250 x 1	250 x 1	250 x 1	250 x 1
	Drain pipe		50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1
	Overflow pipe		50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1
	Auto make up pipe		50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1
	Manual make up pipe		50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1
Make-up	Evaporation loss	%	0.84								
	Drift loss	%	0.005								
Weight	Dry weight	kg	2490	2550	2850	3810	3895	4680	5750	5850	6750
	Operating weight	kg	5780	5840	6590	8650	8690	11800	13100	13480	15300
Internal head loss		mm	5095	5355	5380	5430	5430	5730	5770	5770	5785
Water storage capacity		litres	3290	3290	3740	4840	4795	7120	7350	7630	8550

The basic design condition of GDS 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
 Manufacturer reserve the right to change the technical data for improvement of products without prior notice.

Item		Model	1 Cell								
			GDS800-1B	GDS850-1B	GDS900-1B	GDS950-1B	GDS1000-1B	GDS1150-1B	GDS1250-1B	GDS1400-1B	GDS1500-1B
Capacity	Cooling capacity	HRT	800	850	900	950	1000	1150	1250	1400	1500
	Water flow rate	m ³ /hr	624	663	702	741	780	905	975	1170	1170
	Hot water temp.	°C	37								
	Cold water temp.	°C	32								
	Wet bulb temp.	°C	27								
Overall dimension	Width (W)	mm	5400	5700			6000	6300	6600	7350	
	Length (L)	mm	5400	5700			6000	6300	6600	7350	
	Total height	mm	5825	5825	5840	5840	5840	6490	6490	6840	
Material	Casing		FRP								
	Framework		Hot-Dip Galvannized Steel								
	Fill		PVC								
	Drift eliminator		PVC								
	Distribution pipe / nozzle		PVC / Polypropylene								
	Cold water basin		FRP								
	Fan Assembly		Hub: Cast Aluminium Alloy, Blade: Cast Aluminium Alloy								
Fan	Fan cylinder		FRP								
	Type		Axial Flow								
	Diameter	mm	3650 x 1	3650 x 1	4000 x 1	4000 x 1	4000 x 1	4000 x 1	4250 x 1	4250 x 1	4250 x 1
	Number of blades		6								
Motor	Fan speed	rpm	320	320	320	320	320	320	260	260	260
	Drive system		V-Belt and Pulley (Option: Gear Drive)								
	Type		Totally enclosed fan cooled 3 phase induction motor, 4 poles								
	Power source		415V/3Ph/50Hz								
	Rated output	kw	30	30	30	37	37	45	45	45	55
Quantity		1									
Distribution System			PVC distribution pipe and lateral tubes equipped with polypropylene spray nozzles								
Piping diameter	Inlet pipe dia.	mm	300 x 1	300 x 1	300 x 1	300 x 1	300 x 1	300 x 1	350 x 1	350 x 1	350 x 1
	Outlet pipe dia.	mm	300 x 1	300 x 1	300 x 1	300 x 1	300 x 1	300 x 1	350 x 1	350 x 1	350 x 1
	Drain pipe	mm	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1
	Overflow pipe	mm	80 x 1	80 x 1	80 x 1	80 x 1	80 x 1	80 x 1	80 x 1	80 x 1	80 x 1
	Auto make up pipe	mm	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1
	Manual make up pipe	mm	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1	50 x 1
Make-up	Evaporation loss	%	0.84								
	Drift loss	%	0.005								
Weight	Dry weight	kg	6860	7560	7660	7760	8810	10550	11500	14170	14300
	Operating weight	kg	15650	19820	20120	20350	21500	24600	25900	30300	30580
Internal head loss		mm	5825	5825	5840	5840	5840	6490	6490	6840	6840
Water storage capacity		litres	8790	12260	12460	12590	12690	14050	14400	16130	16280

The basic design condition of GDS 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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Item			Model		2 Cells						
					GDS700-2B	GDS800-2B	GDS900-2B	GDS1000-2B	GDS1100-2B	GDS1200-2B	GDS1300-2B
Capacity	Cooling capacity	HRT	700	800	900	1000	1100	1200	1300	1400	1500
	Water flow rate	m ³ /hr	546	624	702	780	858	936	1014	1092	1170
	Hot water temp.	°C	37								
	Cold water temp.	°C	32								
	Wet bulb temp.	°C	27								
Overall dimension	Width (W)	mm	3550		3950	4350		4800	5100		5400
	Length (L)	mm	7100		7900	8700		9600	10200		10800
	Total height	mm	5095	5355	5380	5430		5730	5770		5785
Material	Casing		FRP								
	Framework		Hot-Dip Galvanized Steel								
	Fill		PVC								
	Drift eliminator		PVC								
	Distribution pipe / nozzle		PVC / Polypropylene								
	Cold water basin		FRP								
	Fan Assembly		Hub: Cast Aluminium Alloy, Blade: Cast Aluminium Alloy								
Fan	Fan cylinder		FRP								
	Type		Axial Flow								
	Diameter	mm	2400 x 2	2750 x 2	3050 x 2	3050 x 2	3050 x 2	3050 x 2	3350 x 2	3350 x 2	3650 x 2
	Number of blades		6								
Fan speed	rpm	420	395	365	365	365	365	365	338	338	320
Motor	Drive system		V-Belt and Pulley (Option: Gear Drive)								
	Type		Totally enclosed fan cooled 3 phase induction motor, 4 poles								
	Power source		415V/3Ph/50Hz								
	Rated output	kw	11 x 2	15 x 2	15 x 2	15 x 2	18.5 x 2	18.5 x 2	18.5 x 2	22 x 2	22 x 2
Quantity		2									
Distribution System			PVC distribution pipe and lateral tubes equipped with polypropylene spray nozzles								
Piping diameter	Inlet pipe dia.		200 x 2	200 x 2	200 x 2	250 x 2	250 x 2	250 x 2	250 x 2	250 x 2	250 x 2
	Outlet pipe dia.		200 x 2	250 x 2	250 x 2	250 x 2	250 x 2	250 x 2	250 x 2	250 x 2	250 x 2
	Drain pipe		50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2
	Overflow pipe		50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2
	Auto make up pipe		50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2
	Manual make up pipe		50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2
Make-up	Evaporation loss	%	0.84								
	Drift loss	%	0.005								
Weight	Dry weight	kg	4980	5100	5700	7620	7790	9360	11500	11700	13500
	Operating weight	kg	11560	11680	13180	17300	17380	23600	26200	26960	30600
Internal head loss	mm	5095	5355	5380	5430	5430	5730	5770	5770	5785	
Water storage capacity	litres	6580	6580	7480	9680	9590	14240	14700	15260	17100	

The basic design condition of GDS 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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Item			Model		2 Cells						
					GDS1600-2B	GDS1700-2B	GDS1800-2B	GDS1900-2B	GDS2000-2B	GDS2300-2B	GDS2500-2B
Capacity	Cooling capacity	HRT	1600	1700	1800	1900	2000	2300	2500	2800	3000
	Water flow rate	m ³ /hr	1248	1326	1404	1482	1560	1810	1950	2340	2340
	Hot water temp.	°C	37								
	Cold water temp.	°C	32								
	Wet bulb temp.	°C	27								
Overall dimension	Width (W)	mm	5400		5700		6000	6300	6600	7350	
	Length (L)	mm	10800		11400		12000	12600	13200	14700	
	Total height	mm	5825	5825	5840	5840	5840	6490	6490	6490	6840
Material	Casing		FRP								
	Framework		Hot-Dip Galvanized Steel								
	Fill		PVC								
	Drift eliminator		PVC								
	Distribution pipe / nozzle		PVC / Polypropylene								
	Cold water basin		FRP								
	Fan Assembly		Hub: Cast Aluminium Alloy, Blade: Cast Aluminium Alloy								
Fan	Fan cylinder		FRP								
	Type		Axial Flow								
	Diameter	mm	3650 x 2	3650 x 2	4000 x 2	4000 x 2	4000 x 2	4000 x 2	4250 x 2	4250 x 2	4250 x 2
	Number of blades		6								
Fan speed	rpm	320	320	320	320	320	320	320	260	260	260
Motor	Drive system		V-Belt and Pulley (Option: Gear Drive)								
	Type		Totally enclosed fan cooled 3 phase induction motor, 4 poles								
	Power source		415V/3Ph/50Hz								
	Rated output	kw	30 x 2	30 x 2	30 x 2	37 x 2	37 x 2	45 x 2	45 x 2	45 x 2	55 x 2
Quantity		2									
Distribution System			PVC distribution pipe and lateral tubes equipped with polypropylene spray nozzles								
Piping diameter	Inlet pipe dia.	mm	300 x 2	300 x 2	300 x 2	300 x 2	300 x 2	300 x 2	350 x 2	350 x 2	350 x 2
	Outlet pipe dia.	mm	300 x 2	300 x 2	300 x 2	300 x 2	300 x 2	300 x 2	350 x 2	350 x 2	350 x 2
	Drain pipe	mm	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2
	Overflow pipe	mm	80 x 2	80 x 2	80 x 2	80 x 2	80 x 2	80 x 2	80 x 2	80 x 2	80 x 2
	Auto make up pipe	mm	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2
	Manual make up pipe	mm	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2	50 x 2
Make-up	Evaporation loss	%	0.84								
	Drift loss	%	0.005								
Weight	Dry weight	kg	13720	15120	15320	15520	17620	21100	23000	28340	28600
	Operating weight	kg	31300	39640	40240	40700	43000	49200	51800	60600	61160
Internal head loss	mm	5825	5825	5840	5840	5840	6490	6490	6840	6840	
Water storage capacity	litres	17580	24520	24920	25180	25380	28100	28800	32260	32560	

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Item			Model		3 Cells							
					GDS1050-3B	GDS1200-3B	GDS1350-3B	GDS1500-3B	GDS1650-3B	GDS1800-3B	GDS1950-3B	GDS2100-3B
Capacity	Cooling capacity	HRT	1050	1200	1350	1500	1650	1800	1950	2100	2250	
	Water flow rate	m ³ /hr	819	936	1053	1170	1287	1404	1521	1638	1755	
	Hot water temp.	°C	37									
	Cold water temp.	°C	32									
	Wet bulb temp.	°C	27									
Overall dimension	Width (W)	mm	3550		3950	4350		4800	5100		5400	
	Length (L)	mm	10650			11850	13050		14400	15300		16200
	Total height	mm	5095	5355	5380	5430		5730	5770		5785	
Material	Casing		FRP									
	Framework		Hot-Dip Galvanized Steel									
	Fill		PVC									
	Drift eliminator		PVC									
	Distribution pipe / nozzle		PVC / Polypropylene									
	Cold water basin		FRP									
	Fan Assembly		Hub: Cast Aluminium Alloy, Blade: Cast Aluminium Alloy									
Fan	Fan cylinder		FRP									
	Type		Axial Flow									
	Diameter	mm	2400 x 3	2750 x 3	3050 x 3	3050 x 3	3050 x 3	3050 x 3	3350 x 3	3350 x 3	3650 x 3	
	Number of blades		6									
Motor	Fan speed	rpm	420	395	365	365	365	365	338	338	320	
	Drive system		V-Belt and Pulley (Option: Gear Drive)									
	Type		Totally enclosed fan cooled 3 phase induction motor, 4 poles									
	Power source		415V/3Ph/50Hz									
Rated output	Rated output	kw	11 x 3	15 x 3	15 x 3	15 x 3	18.5 x 3	18.5 x 3	18.5 x 3	22 x 3	22 x 3	
	Quantity		3									
Distribution System			PVC distribution pipe and lateral tubes equipped with polypropylene spray nozzles									
Piping diameter	Inlet pipe dia.	mm	200 x 3	200 x 3	200 x 3	250 x 3	250 x 3	250 x 3	250 x 3	250 x 3	250 x 3	
	Outlet pipe dia.	mm	200 x 3	250 x 3	250 x 3	250 x 3	250 x 3	250 x 3	250 x 3	250 x 3	250 x 3	
	Drain pipe	mm	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	
	Overflow pipe	mm	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	
	Auto make up pipe	mm	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	
	Manual make up pipe	mm	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	
Make-up	Evaporation loss	%	0.84									
	Drift loss	%	0.005									
Weight	Dry weight	kg	7470	7650	8550	11430	11685	14040	17250	17550	20250	
	Operating weight	kg	17340	17520	19770	25950	26070	35400	39300	40440	45900	
Internal head loss			mm	5095	5355	5380	5430	5430	5730	5770	5785	
Water storage capacity			litres	9870	9870	11220	14520	14385	21360	22050	22890	25650

The basic design condition of GDS 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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Item			Model		3 Cells							
					GDS2400-3B	GDS2550-3B	GDS2700-3B	GDS2850-3B	GDS3000-3B	GDS3450-3B	GDS3750-3B	GDS4200-3B
Capacity	Cooling capacity	HRT	2400	2550	2700	2850	3000	3450	3750	4200	4500	
	Water flow rate	m ³ /hr	1872	1989	2106	2223	2340	2715	2925	3510	4095	
	Hot water temp.	°C	37									
	Cold water temp.	°C	32									
	Wet bulb temp.	°C	27									
Overall dimension	Width (W)	mm	5400		5700		6000		6300	7350		
	Length (L)	mm	16200			17100		18000		18900	22050	
	Total height	mm	5825	5825	5840	5840	5840	6490	6490	6840		
Material	Casing		FRP									
	Framework		Hot-Dip Galvanized Steel									
	Fill		PVC									
	Drift eliminator		PVC									
	Distribution pipe / nozzle		PVC / Polypropylene									
	Cold water basin		FRP									
	Fan Assembly		Hub: Cast Aluminium Alloy, Blade: Cast Aluminium Alloy									
Fan	Fan cylinder		FRP									
	Type		Axial Flow									
	Diameter	mm	3650 x 3	3650 x 3	4000 x 3	4000 x 3	4000 x 3	4000 x 3	4250 x 3	4250 x 3	4250 x 3	
	Number of blades		6									
Motor	Fan speed	rpm	320	320	320	320	320	320	260	260	260	
	Drive system		V-Belt and Pulley (Option: Gear Drive)									
	Type		Totally enclosed fan cooled 3 phase induction motor, 4 poles									
	Power source		415V/3Ph/50Hz									
Rated output	Rated output	kw	30 x 3	30 x 3	30 x 3	37 x 3	37 x 3	45 x 3	45 x 3	45 x 3	55 x 3	
	Quantity		3									
Distribution System			PVC distribution pipe and lateral tubes equipped with polypropylene spray nozzles									
Piping diameter	Inlet pipe dia.	mm	300 x 3	300 x 3	300 x 3	300 x 3	300 x 3	300 x 3	350 x 3	350 x 3	350 x 3	
	Outlet pipe dia.	mm	300 x 3	300 x 3	300 x 3	300 x 3	300 x 3	300 x 3	350 x 3	350 x 3	350 x 3	
	Drain pipe	mm	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	
	Overflow pipe	mm	80 x 3	80 x 3	80 x 3	80 x 3	80 x 3	80 x 3	80 x 3	80 x 3	80 x 3	
	Auto make up pipe	mm	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	
	Manual make up pipe	mm	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	50 x 3	
Make-up	Evaporation loss	%	0.84									
	Drift loss	%	0.005									
Weight	Dry weight	kg	20580	22680	22980	23280	26430	31650	34500	42510	42900	
	Operating weight	kg	46950	59460	60360	61050	64500	73800	77700	90900	91740	
Internal head loss			mm	5825	5825	5840	5840	5840	6490	6490	6840	6840
Water storage capacity			litres	26370	36780	37380	37770	38070	42150	43200	48390	48840

The basic design condition of GDS 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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Item		Model	4 Cells								
			GDS1400-4B	GDS1600-4B	GDS1800-4B	GDS2000-4B	GDS2200-4B	GDS2400-4B	GDS2600-4B	GDS2800-4B	GDS3000-4B
Capacity	Cooling capacity	HRT	1400	1600	1800	2000	2200	2400	2600	2800	3000
	Water flow rate	m ³ /hr	1092	1248	1404	1560	1716	1872	2028	2184	2340
	Hot water temp.	°C	37								
	Cold water temp.	°C	32								
	Wet bulb temp.	°C	27								
Overall dimension	Width (W)	mm	3550		3950	4350		4800	5100		5400
	Length (L)	mm	14200		15800	17400		19200	20400		21600
	Total height	mm	5095	5355	5380	5430		5730	5770		5785
Material	Casing		FRP								
	Framework		Hot-Dip Galvannized Steel								
	Fill		PVC								
	Drift eliminator		PVC								
	Distribution pipe / nozzle		PVC / Polypropylene								
	Cold water basin		FRP								
	Fan Assembly		Hub: Cast Aluminium Alloy, Blade: Cast Aluminium Alloy								
	Fan cylinder		FRP								
Fan	Type		Axial Flow								
	Diameter	mm	2400 x 4	2750 x 4	3050 x 4	3050 x 4	3050 x 4	3050 x 4	3350 x 4	3350 x 4	3650 x 4
	Number of blades		6								
	Fan speed	rpm	420	395	365	365	365	365	338	338	320
Motor	Drive system		V-Belt and Pulley (Option: Gear Drive)								
	Type		Totally enclosed fan cooled 3 phase induction motor, 4 poles								
	Power source		415V/3Ph/50Hz								
	Rated output	kw	11 x 4	15 x 4	15 x 4	15 x 4	18.5 x 4	18.5 x 4	18.5 x 4	22 x 4	22 x 4
	Quantity		4								
Distribution System			PVC distribution pipe and lateral tubes equipped with polypropylene spray nozzles								
Piping diameter	Inlet pipe dia.		200 x 4	200 x 4	200 x 4	250 x 4	250 x 4	250 x 4	250 x 4	250 x 4	250 x 4
	Outlet pipe dia.		200 x 4	250 x 4	250 x 4	250 x 4	250 x 4	250 x 4	250 x 4	250 x 4	250 x 4
	Drain pipe		50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4
	Overflow pipe		50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4
	Auto make up pipe		50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4
	Manual make up pipe		50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4
Make-up	Evaporation loss	%	0.84								
	Drift loss	%	0.005								
Weight	Dry weight	kg	9960	5355	5380	5430	5430	5730	5770	5770	27000
	Operating weight	kg	23120	23360	26360	34600	34760	47200	52400	53920	61200
Internal head loss		mm	5095	4760	4760	5060	5060	5060	5060	5370	5785
Water storage capacity		litres	13160	18005	20980	29170	29330	41470	46630	48150	34200

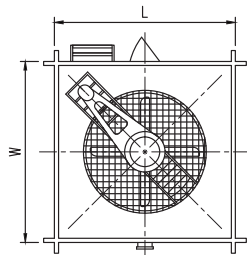
The basic design condition of GDS series is based on hot water inlet 37°C, cold water outlet : 32°C, Ambient WB: 27°C, 13 l/min/HRT water flow rate
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Item		Model	4 Cells								
			GDS3200-4B	GDS3400-4B	GDS3600-4B	GDS3800-4B	GDS4000-4B	GDS4600-4B	GDS5000-4B	GDS5600-4B	GDS6000-4B
Capacity	Cooling capacity	HRT	3200	3400	3600	3800	4000	4600	5000	5600	6000
	Water flow rate	m ³ /hr	2496	2652	2808	2964	3120	3620	3900	4680	5460
	Hot water temp.	°C	37								
	Cold water temp.	°C	32								
	Wet bulb temp.	°C	27								
Overall dimension	Width (W)	mm	5400	5700			6000	6300	6600	7350	
	Length (L)	mm	21600	22800			24000	25200	26400	29400	
	Total height	mm	5825	5825	5840	5840	5840	6490	6490	6840	
Material	Casing		FRP								
	Framework		Hot-Dip Galvannized Steel								
	Fill		PVC								
	Drift eliminator		PVC								
	Distribution pipe / nozzle		PVC / Polypropylene								
	Cold water basin		FRP								
	Fan Assembly		Hub: Cast Aluminium Alloy, Blade: Cast Aluminium Alloy								
Fan	Fan cylinder		FRP								
	Type		Axial Flow								
	Diameter	mm	3650 x 4	3650 x 4	4000 x 4	4000 x 4	4000 x 4	4000 x 4	4250 x 4	4250 x 4	4250 x 4
	Number of blades		6								
Motor	Fan speed	rpm	320	320	320	320	320	320	260	260	260
	Drive system		V-Belt and Pulley (Option: Gear Drive)								
	Type		Totally enclosed fan cooled 3 phase induction motor, 4 poles								
	Power source		415V/3Ph/50Hz								
	Rated output	kw	30 x 4	30 x 4	30 x 4	37 x 4	37 x 4	45 x 4	45 x 4	45 x 4	55 x 4
Quantity		4									
Distribution System			PVC distribution pipe and lateral tubes equipped with polypropylene spray nozzles								
Piping diameter	Inlet pipe dia.	mm	300 x 4	300 x 4	300 x 4	300 x 4	300 x 4	300 x 4	350 x 4	350 x 4	350 x 4
	Outlet pipe dia.	mm	300 x 4	300 x 4	300 x 4	300 x 4	300 x 4	300 x 4	350 x 4	350 x 4	350 x 4
	Drain pipe	mm	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4
	Overflow pipe	mm	80 x 4	80 x 4	80 x 4	80 x 4	80 x 4	80 x 4	80 x 4	80 x 4	80 x 4
	Auto make up pipe	mm	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4
	Manual make up pipe	mm	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4	50 x 4
Make-up	Evaporation loss	%	0.84								
	Drift loss	%	0.005								
Weight	Dry weight	kg	27440	30240	30640	31040	35240	42200	46000	56680	57200
	Operating weight	kg	62600	79280	80480	81400	86000	98400	103600	121200	122320
Internal head loss		mm	5825	5825	5840	5840	5840	6490	6490	6840	6840
Water storage capacity		litres	35160	49040	49840	50360	50760	56200	57600	64520	65120

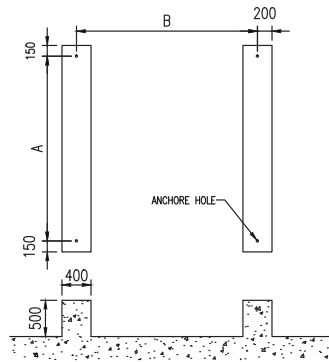
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DESIGN OF GD SERIES

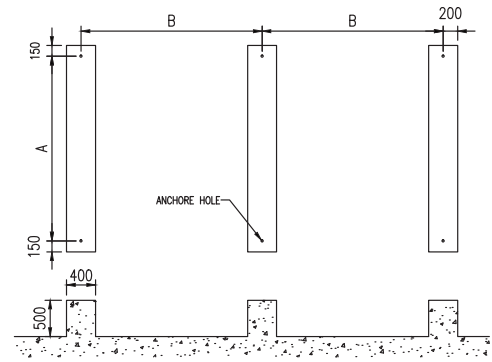
GD-1 CELL



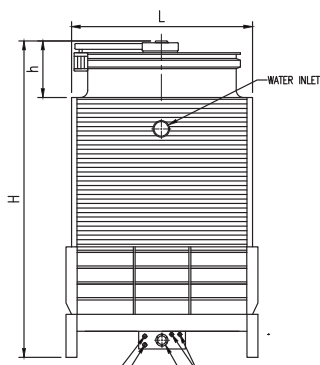
PLAN VIEW



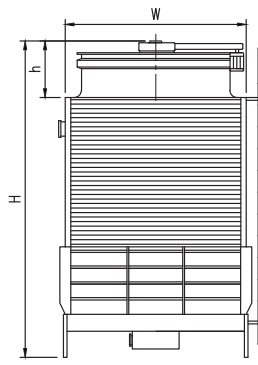
CONCRETE FOUNDATION FOR GD50 TO GD125



CONCRETE FOUNDATION FOR GD150 AND ABOVE



FRONT VIEW

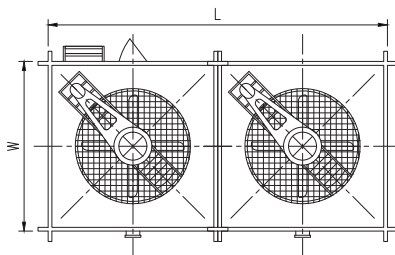


SIDE VIEW

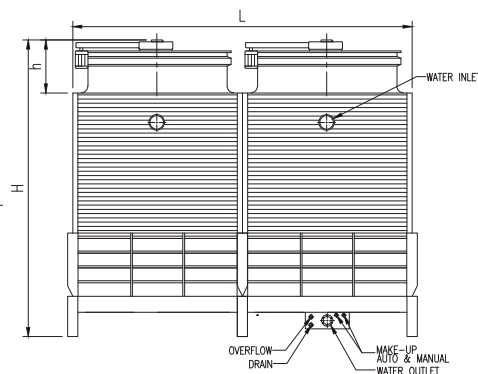
NOTE: ALL DIMENSION IN MM

MODEL	TOWER DIMENSION				FOUNDATION DETAILS		
	L	W	H	h	A	B	C
GD 50	1600	1600	3345	300	1650	1600	-
GD 60	1600	1600	3690	590	1650	1600	-
GD 70	1800	1800	3890	590	1850	1800	-
GD 80	1800	1800	3905	975	1850	1800	-
GD 100	2150	2150	3930	870	2200	2150	-
GD 125	2150	2150	4285	925	2200	2150	-
GD 150	2750	2750	4310	880	2800	1375	-
GD 175	2750	2750	4310	880	2800	1375	-
GD 200	2750	2750	4670	880	2800	1375	-
GD 225	3150	3150	4670	880	3200	1575	-
GD 250	3150	3150	4670	880	3200	1575	-
GD 280	3350	3350	5100	1060	3400	1675	-
GD 300	3350	3350	5360	1320	3400	1675	-
GD 325	3350	3350	5100	1060	3400	1675	-

GD-2 CELL



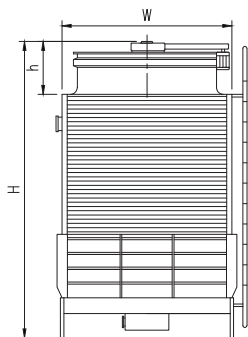
PLAN VIEW



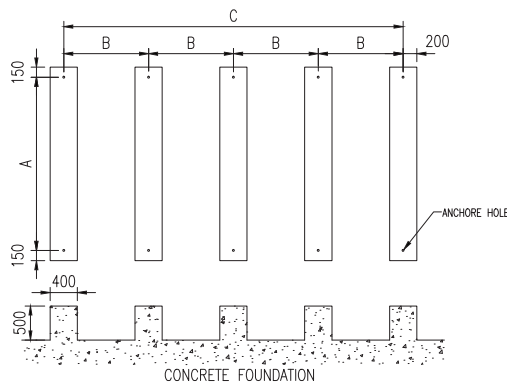
FRONT VIEW

NOTE: ALL DIMENSION IN MM

MODEL	TOWER DIMENSION				FOUNDATION DETAILS		
	L	W	H	h	A	B	C
GD 350	5500	2750	4310	880	2800	1375	5500
GD 400	5500	2750	4670	880	2800	1375	5500
GD 450	6300	3150	4670	880	3200	1575	6300
GD 500	6300	3150	4670	880	3200	1575	6300
GD 560	6700	3350	5100	1060	3400	1675	6700
GD 600	6700	3350	5360	1320	3400	1675	6700
GD 650	6700	3350	5100	1060	3400	1675	6700

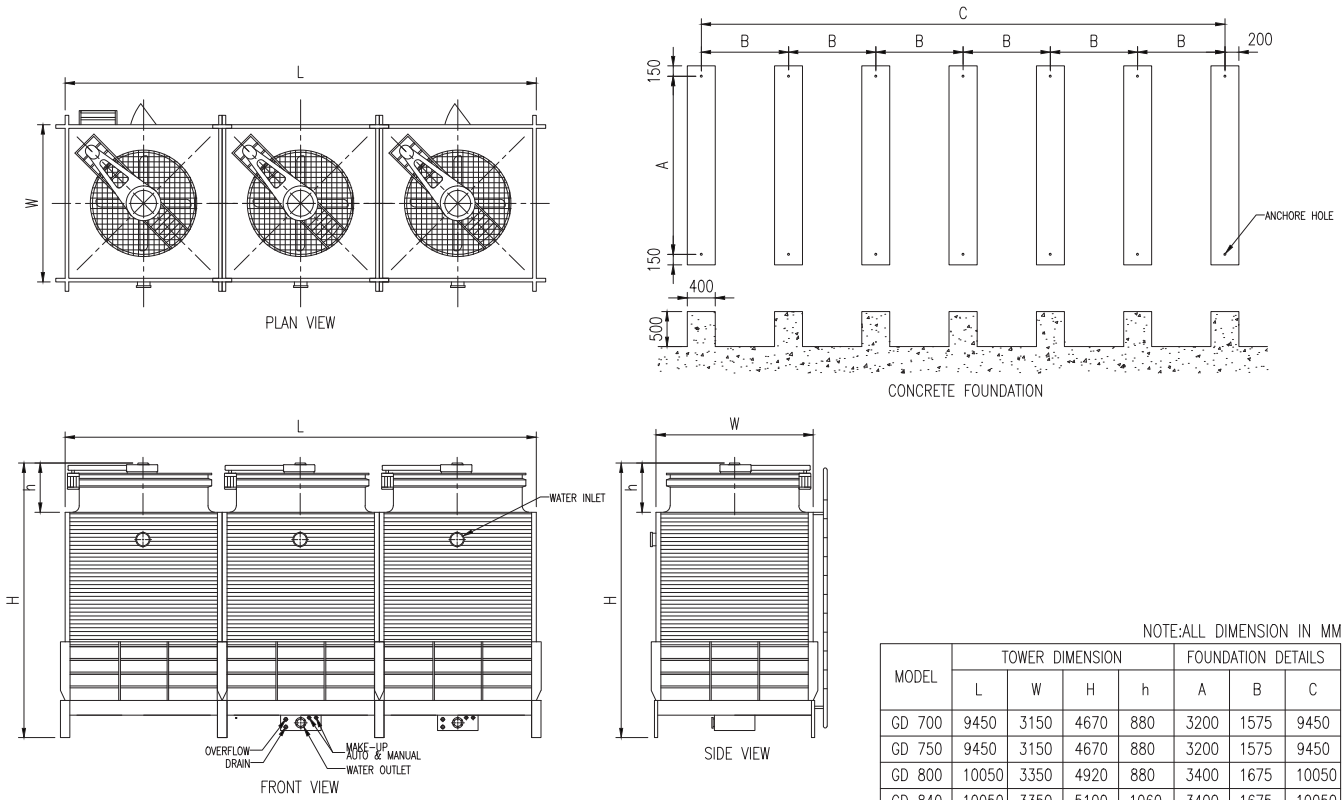


SIDE VIEW



CONCRETE FOUNDATION

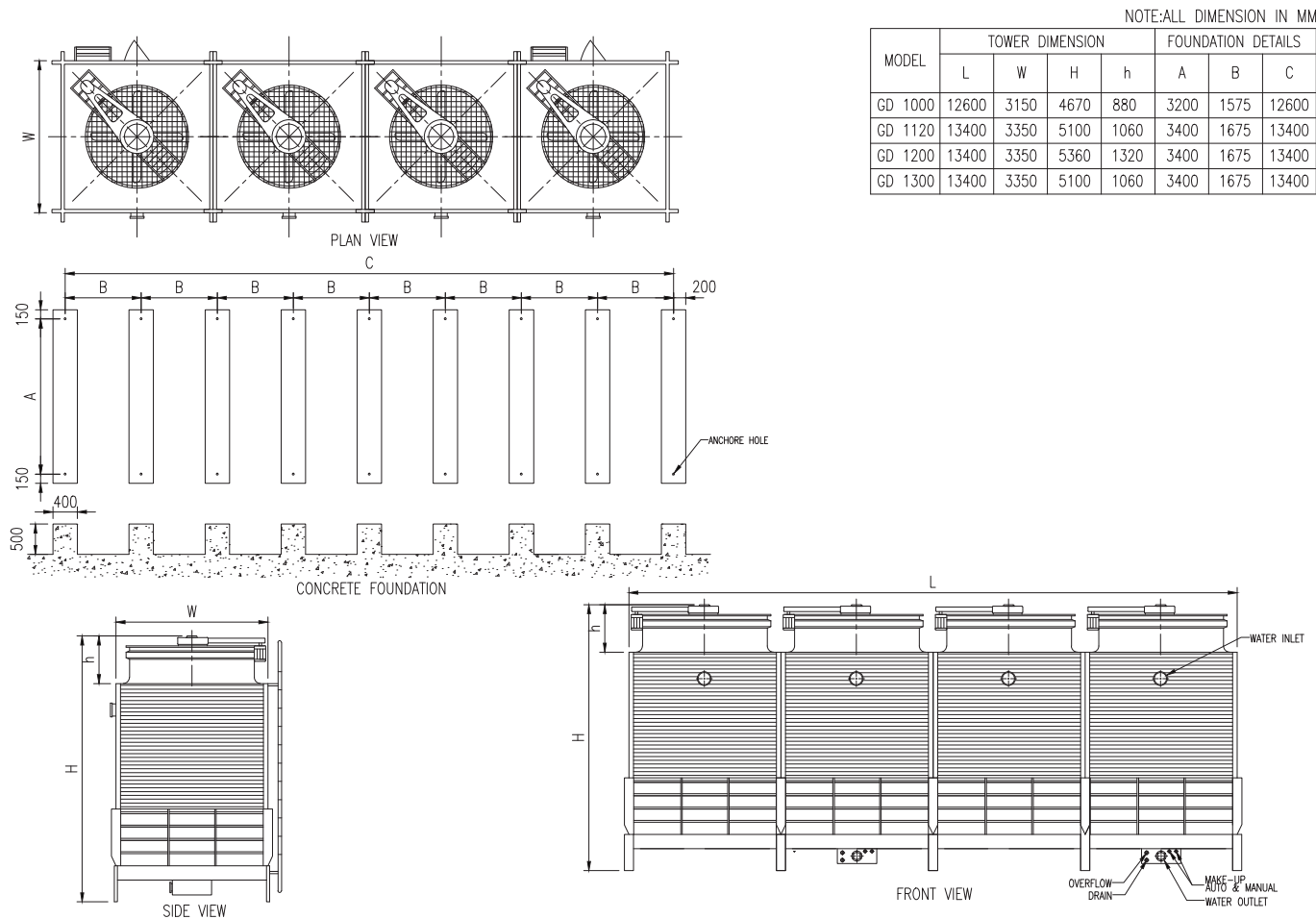
GD-3 CELL



NOTE: ALL DIMENSION IN MM

MODEL	TOWER DIMENSION				FOUNDATION DETAILS		
	L	W	H	h	A	B	C
GD 700	9450	3150	4670	880	3200	1575	9450
GD 750	9450	3150	4670	880	3200	1575	9450
GD 800	10050	3350	4920	880	3400	1675	10050
GD 840	10050	3350	5100	1060	3400	1675	10050
GD 900	10050	3350	5360	1320	3400	1675	10050

GD-4 CELL

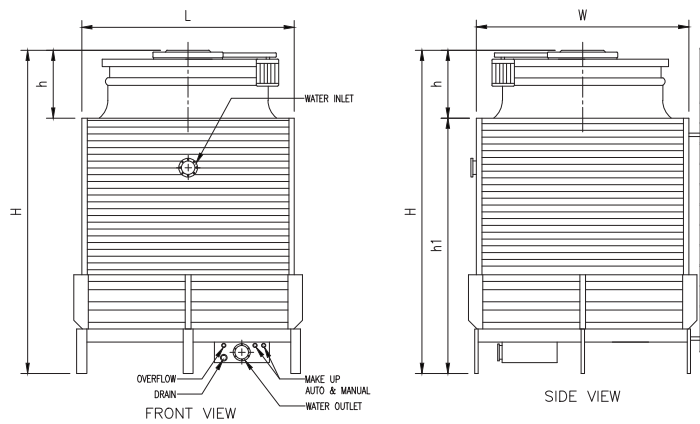
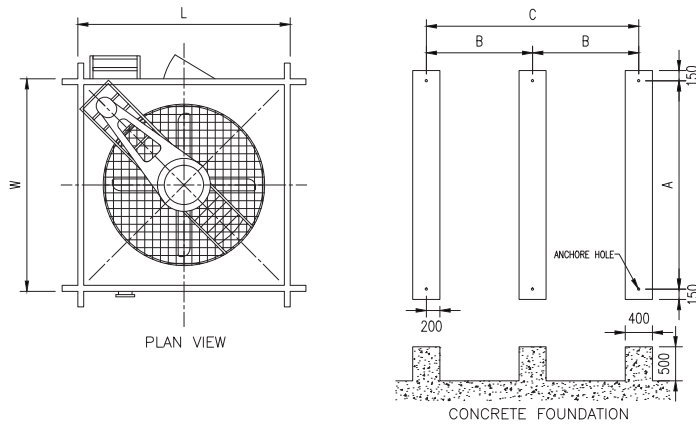


NOTE: ALL DIMENSION IN MM

MODEL	TOWER DIMENSION				FOUNDATION DETAILS		
	L	W	H	h	A	B	C
GD 1000	12600	3150	4670	880	3200	1575	12600
GD 1120	13400	3350	5100	1060	3400	1675	13400
GD 1200	13400	3350	5360	1320	3400	1675	13400
GD 1300	13400	3350	5100	1060	3400	1675	13400

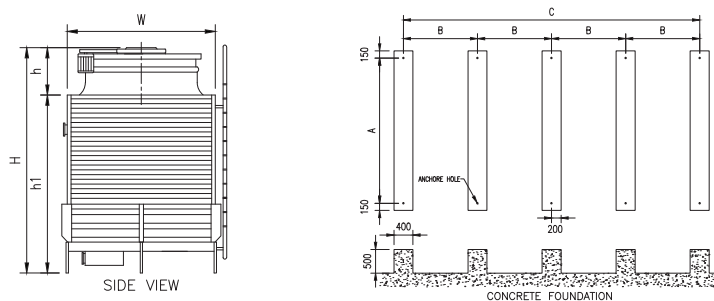
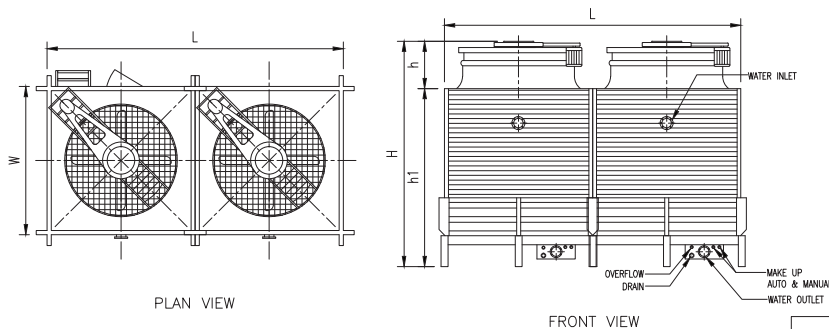
DESIGN OF GDS SERIES

GDS-1 CELL



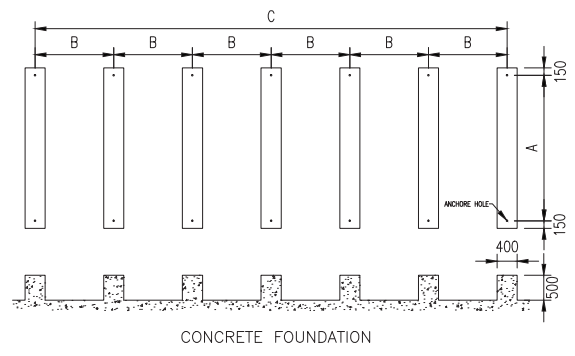
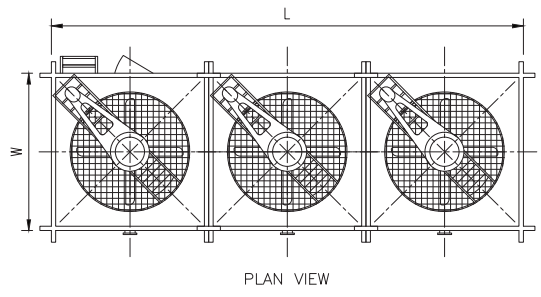
MODEL	TOWER DIMENSION					NOTE: ALL DIMENSION IN MM		
	L	W	H	h1	h	A	B	C
GDS 350-1B	3550	3550	5095	4035	1060	3600	1775	3550
GDS 400-1B	3550	3550	5355	4035	1320	3600	1775	3550
GDS 450-1B	3950	3950	5380	4085	1295	4000	1975	3950
GDS 500-1B	4350	4350	5430	4135	1295	4400	2175	4350
GDS 550-1B	4350	4350	5430	4135	1295	4400	2175	4350
GDS 600-1B	4800	4800	5730	4435	1295	4850	2400	4800
GDS 650-1B	5100	5100	5770	4435	1335	5150	2550	5100
GDS 700-1B	5100	5100	5770	4435	1335	5150	2550	5100
GDS 750-1B	5400	5400	5785	4435	1350	5450	2700	5400
GDS 800-1B	5400	5400	5825	4490	1335	5450	2700	5400
GDS 850-1B	5700	5700	5825	4490	1335	5750	2850	5700
GDS 900-1B	5700	5700	5840	4490	1350	5750	2850	5700
GDS 950-1B	5700	5700	5840	4490	1350	5750	2850	5700
GDS 1000-1B	6000	6000	5840	4490	1350	6050	3000	6000
GDS 1150-1B	6300	6300	6490	5140	1350	6350	3150	6300
GDS 1250-1B	6600	6600	6490	5140	1350	6650	3300	6600
GDS 1400-1B	7350	7350	6840	5490	1350	7400	3675	7350
GDS 1500-1B	7350	7350	6840	5490	1350	7400	3675	7350

GDS-2 CELL

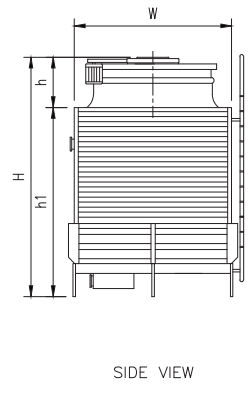
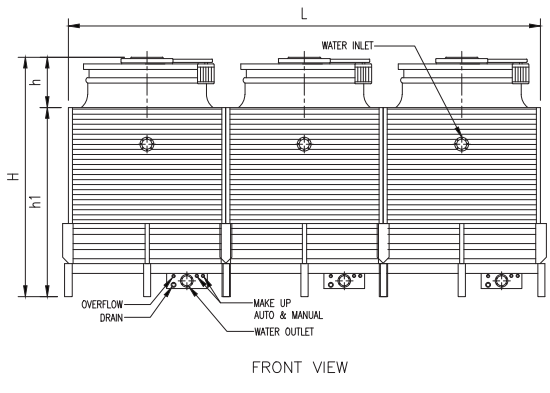


MODEL	TOWER DIMENSION					FOUNDATION DETAILS		
	L	W	H	h1	h	A	B	C
GDS 700-2B	7100	3550	5095	4035	1060	3600	1775	7100
GDS 800-2B	7100	3550	5355	4035	1320	3600	1775	7100
GDS 900-2B	7900	3950	5380	4085	1295	4000	1975	7900
GDS 1000-2B	8700	4350	5430	4135	1295	4400	2175	8700
GDS 1100-2B	8700	4350	5430	4135	1295	4400	2175	8700
GDS 1200-2B	9600	4800	5730	4435	1295	4850	2400	9600
GDS 1300-2B	10200	5100	5770	4435	1335	5150	2550	10200
GDS 1400-2B	10200	5100	5770	4435	1335	5150	2550	10200
GDS 1500-2B	10800	5400	5785	4435	1350	5450	2700	10800
GDS 1600-2B	10800	5400	5825	4490	1335	5450	2700	10800
GDS 1700-2B	11400	5700	5825	4490	1335	5750	2850	11400
GDS 1800-2B	11400	5700	5840	4490	1350	5750	2850	11400
GDS 1900-2B	11400	5700	5840	4490	1350	5750	2850	11400
GDS 2000-2B	12000	6000	5840	4490	1350	6050	3000	12000
GDS 2300-2B	12600	6300	6490	5140	1350	6350	3150	12600
GDS 2500-2B	13200	6600	6490	5140	1350	6650	3300	13200
GDS 2800-2B	14700	7350	6840	5490	1350	7400	3675	14700
GDS 3000-2B	14700	7350	6840	5490	1350	7400	3675	14700

GDS-3 CELL

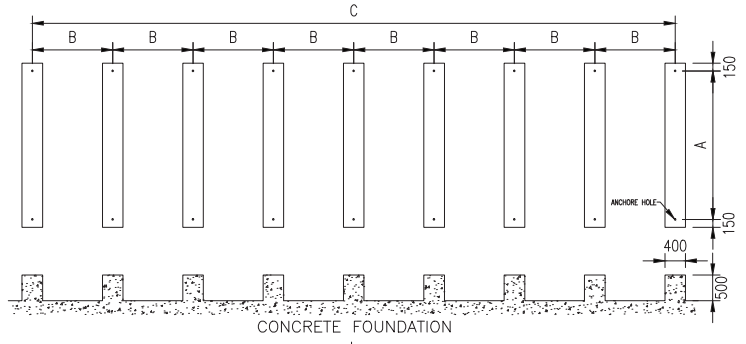
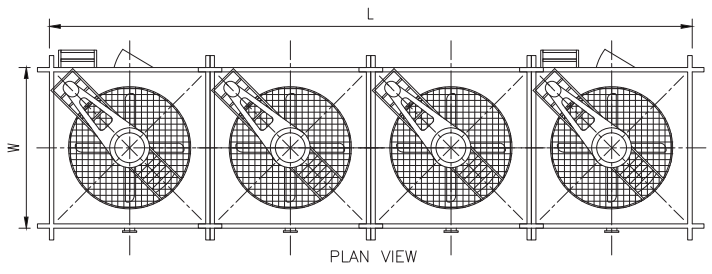


NOTE: ALL DIMENSION IN mm

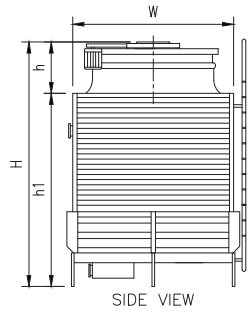
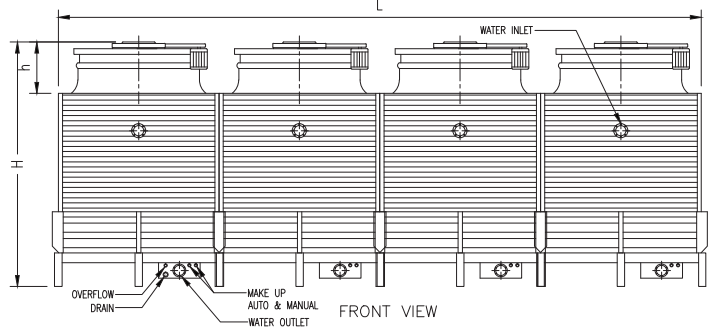


MODEL	TOWER DIMENSION					FOUNDATION DETAILS		
	L	W	H	h1	h	A	B	C
GDS 1050-3B	10650	3550	5095	4035	1060	3600	1775	10650
GDS 1200-3B	10650	3550	5355	4035	1320	3600	1775	10650
GDS 1350-3B	11850	3950	5380	4085	1295	4000	1975	11850
GDS 1500-3B	13050	4350	5430	4135	1295	4400	2175	13050
GDS 1650-3B	13050	4350	5430	4135	1295	4400	2175	13050
GDS 1800-3B	14400	4800	5730	4435	1295	4850	2400	14400
GDS 1950-3B	15300	5100	5770	4435	1335	5150	2550	15300
GDS 2100-3B	15300	5100	5770	4435	1335	5150	2550	15300
GDS 2250-3B	16200	5400	5785	4435	1350	5450	2700	16200
GDS 2400-3B	16200	5400	5825	4490	1335	5450	2700	16200
GDS 2550-3B	17100	5700	5825	4490	1335	5750	2850	17100
GDS 2700-3B	17100	5700	5840	4490	1350	5750	2850	17100
GDS 2850-3B	17100	5700	5840	4490	1350	5750	2850	17100
GDS 3000-3B	18000	6000	5840	4490	1350	6050	3000	18000
GDS 3450-3B	18900	6300	6490	5140	1350	6350	3150	18900
GDS 3750-3B	19800	6600	6490	5140	1350	6650	3300	19800
GDS 4200-3B	22050	7350	6840	5490	1350	7400	3675	22050
GDS 4500-3B	22050	7350	6840	5490	1350	7400	3675	22050

GDS-4 CELL



NOTE: ALL DIMENSION IN mm



MODEL	TOWER DIMENSION					FOUNDATION DETAILS		
	L	W	H	h1	h	A	B	C
GDS 1400-4B	14200	3550	5095	4035	1060	3600	1775	14200
GDS 1600-4B	14200	3550	5355	4035	1320	3600	1775	14200
GDS 1800-4B	15800	3950	5380	4085	1295	4000	1975	15800
GDS 2000-4B	17400	4350	5430	4135	1295	4400	2175	17400
GDS 2200-4B	17400	4350	5430	4135	1295	4400	2175	17400
GDS 2400-4B	19200	4800	5730	4435	1295	4850	2400	19200
GDS 2600-4B	20400	5100	5770	4435	1335	5150	2550	20400
GDS 2800-4B	20400	5100	5770	4435	1335	5150	2550	20400
GDS 3000-4B	21600	5400	5785	4435	1350	5450	2700	21600
GDS 3200-4B	21600	5400	5825	4490	1335	5450	2700	21600
GDS 3400-4B	22800	5700	5825	4490	1335	5750	2850	22800
GDS 3600-4B	22800	5700	5840	4490	1350	5750	2850	22800
GDS 3800-4B	22800	5700	5840	4490	1350	5750	2850	22800
GDS 4000-4B	24000	6000	5840	4490	1350	6050	3000	24000
GDS 4600-4B	25200	6300	6490	5140	1350	6350	3150	25200
GDS 5000-4B	26400	6600	6490	5140	1350	6650	3300	26400
GDS 5600-4B	29400	7350	6840	5490	1350	7400	3675	29400
GDS 6000-4B	29400	7350	6840	5490	1350	7400	3675	29400

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.



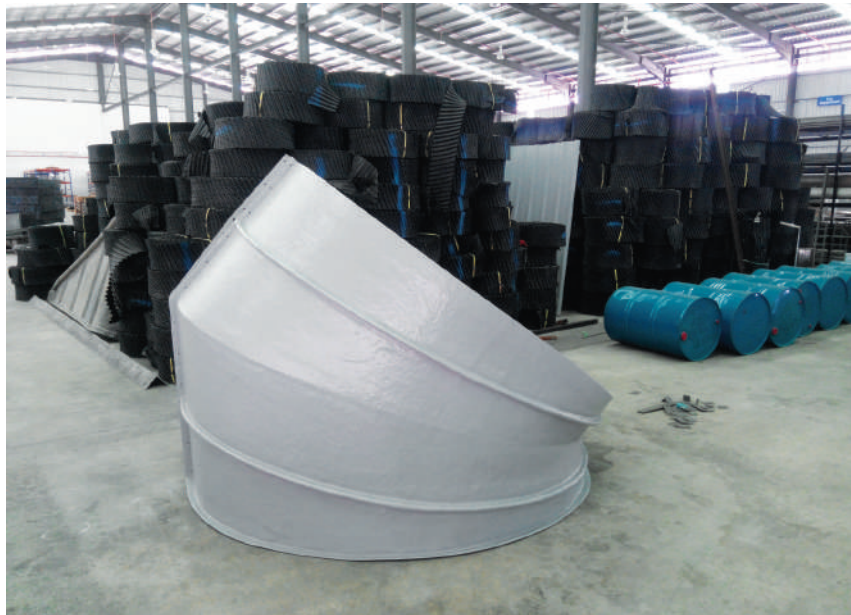
HANDRAIL

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

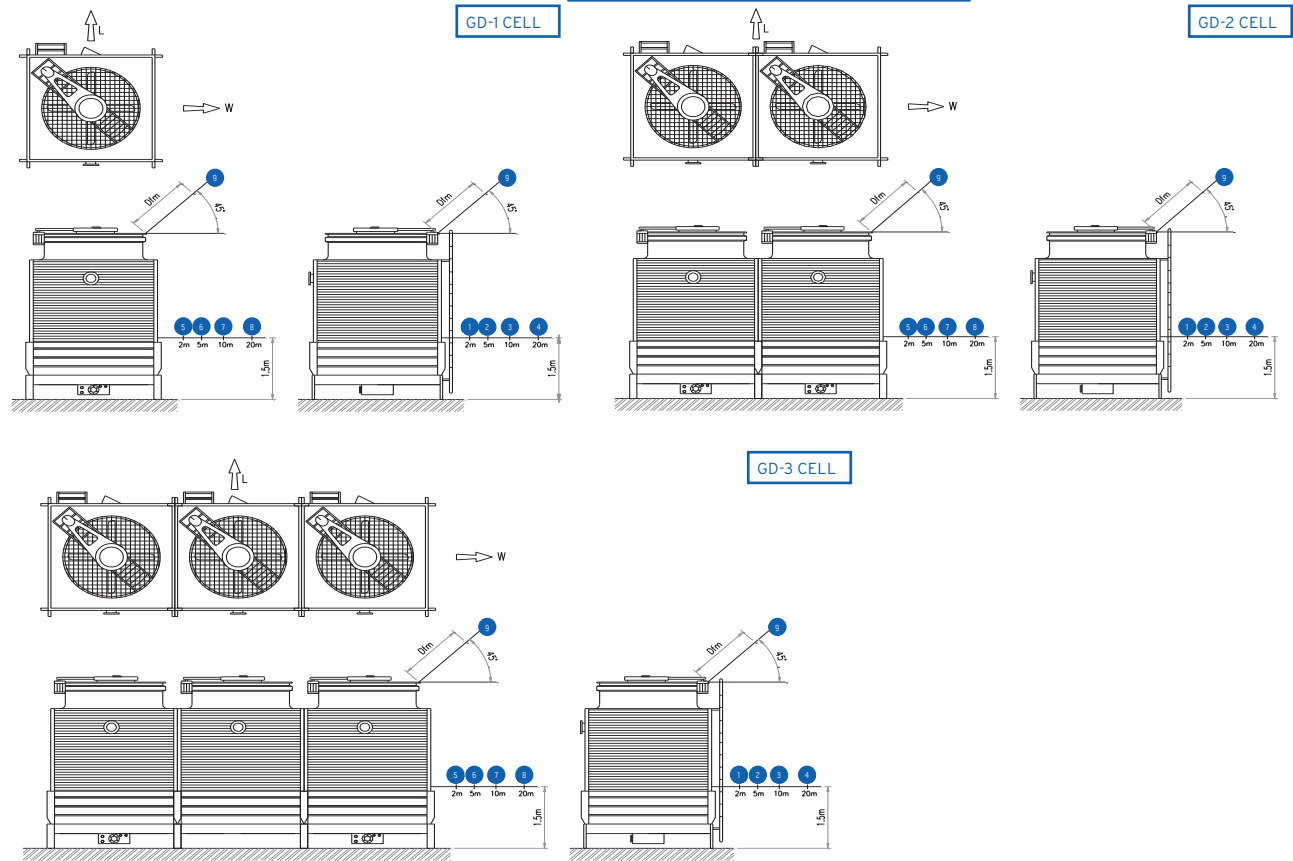
Our high efficiency motor are rated to Eff2 or IE1 (standard), Eff1 and IE2 (high efficiency). We also offer latest IE3 (premium) standards as indicated by IEC 60034-30. The choice of efficiency is up the client's preferences. For usage with variable speed inverters, we recommend special modification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



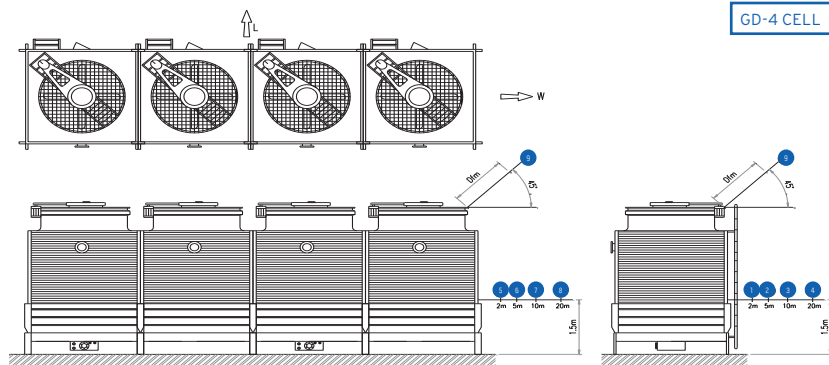
DISCHARGE HOOD

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 GD SERIES

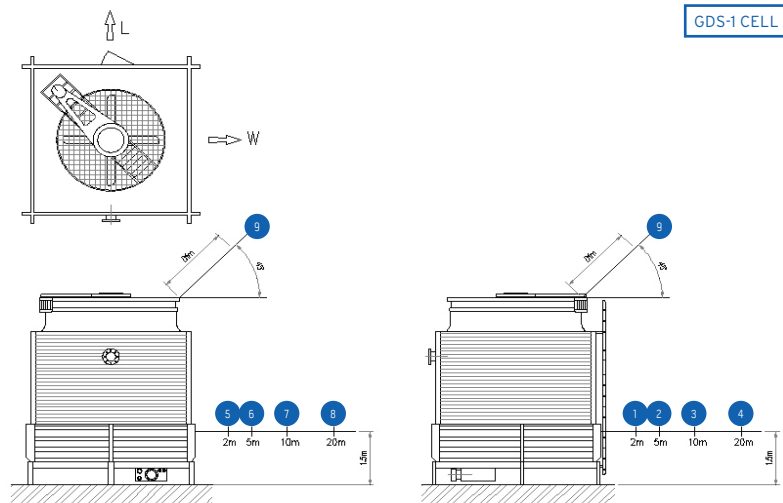


Model		SOUND LEVEL dB(A)								
		Louver (L)				Panel (W)				FAN (Dfm) (45°)
		1	2	3	4	5	6	7	8	9
GD-1 CELL	GD50	70	66	61	55	70	66	61	55	69
	GD60	70	66	61	55	70	66	61	55	69
	GD70	70.5	66.5	61.5	55.5	70.5	66.5	61.5	55.5	69.5
	GD80	70.5	66.5	61.5	55.5	70.5	66.5	61.5	55.5	69.5
	GD100	71	67	62	56	71	67	62	56	70
	GD125	71.5	67.5	62.5	56.5	71.5	67.5	62.5	56.5	70.5
	GD150	72	68	63	57	72	68	63	57	71
	GD175	72	68.5	63.5	57	72	68.5	63.5	57	71
	GD200	72.5	69	63.5	58	72.5	69	63.5	58	71.5
	GD225	72.5	69.5	63.5	60.5	72.5	69.5	63.5	60.5	71.5
	GD250	72.5	69.5	63.5	60.5	72.5	69.5	63.5	60.5	72
	GD280	73	70	65.5	61	73	70	65.5	61	72
GD300	73	70	65.5	61	73	70	65.5	61	72.5	
GD-2 CELL	GD350	74	70.5	66	59.5	71.5	70.5	66	61.5	72.5
	GD400	73.5	71	66	59.5	71.5	70.5	65	61.5	73
	GD450	74	71	66.5	60	72	69.5	64.5	60	73
	GD500	74.5	71.5	67.5	61	73.5	69.5	64.5	59	75
	GD560	74.5	72	67.5	61	73.5	69.5	65	60	75
	GD600	74.5	72	68	61.5	73.5	69.5	66	60	75
GD-3 CELL	GD650	75	72	68.5	61.5	74	70	66.5	60.5	74
	GD700	75.5	72.5	68.5	62.5	74.5	70.5	65.5	60	75.5
	GD750	75.5	72.5	68.5	62.5	74.5	70.5	65.5	60	75.5
	GD800	74	71	67	61	72.5	69.5	64	61	76
	GD900	74.5	71.5	68	62	73.5	70.5	65	62	76.5

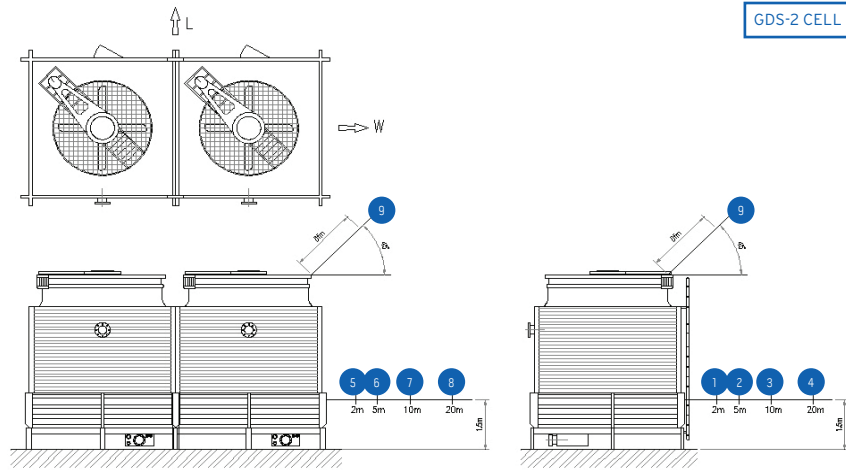


GD-4 CELL	GD1000	75	72.5	68.5	62.5	74	70	65.5	61	76.5
	GD1120	75.5	72.5	69	63	74.5	70.5	66	62	77
	GD1200	76	73	69.5	63.5	75	70.5	66.5	62.5	77
	GD1300	77	73	70	64	75.5	71	67	63	78

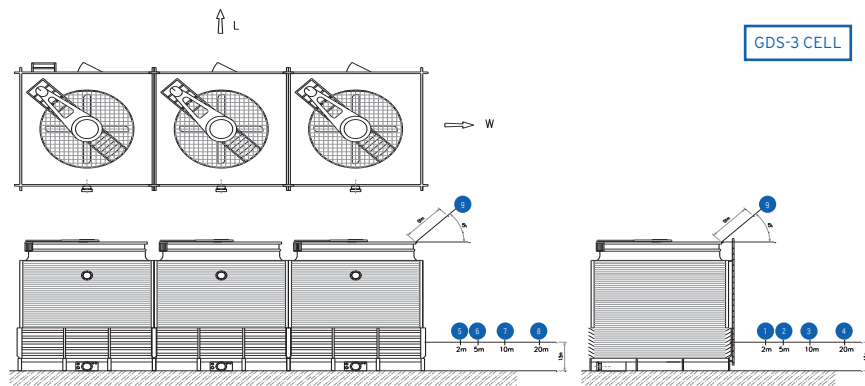
NOISE DATA OF GDS SERIES



Model	SOUND LEVEL dB(A)								
	Louver (L)				Panel (W)				FAN (Dfm) (45°)
	1	2	3	4	5	6	7	8	9
GDS350-1B	76	71.5	67	63	76	71.5	67	63	76.5
GDS400-1B	76.5	72	67.5	64	76.5	72	67.5	64	77.5
GDS450-1B	76.5	73	67.5	64.5	76.5	73	67.5	64.5	78
GDS500-1B	77	73.5	68	65	77	73.5	68	65	79
GDS550-1B	78	75	70	65	78	75	70	65	80
GDS600-1B	79	75.5	71	66	79	75.5	71	66	80.5
GDS650-1B	80	76	71.5	67	80	76	71.5	67	81
GDS700-1B	80.5	76	71.5	67.5	80.5	76	71.5	67.5	81
GDS750-1B	81	76.5	72	68	81	76.5	72	68	81.5
GDS800-1B	81.5	77	72.5	68.5	81.5	77	72.5	68.5	82
GDS850-1B	82	78	73	69	82	78	73	69	82
GDS900-1B	82.5	78.5	73.5	69.5	82.5	78.5	73.5	69.5	82.5
GDS950-1B	83	79	74	69.5	83	79	74	69.5	82.5
GDS1000-1B	83.5	79.5	74.5	70	83.5	79.5	74.5	70	83
GDS1250-1B	84	80	75	70.5	84	80	75	70.5	83.5
GDS1400-1B	84.5	80.5	75.5	71	84.5	80.5	75.5	71	84
GDS1500-1B	85	81	76	72	85	81	76	72	84

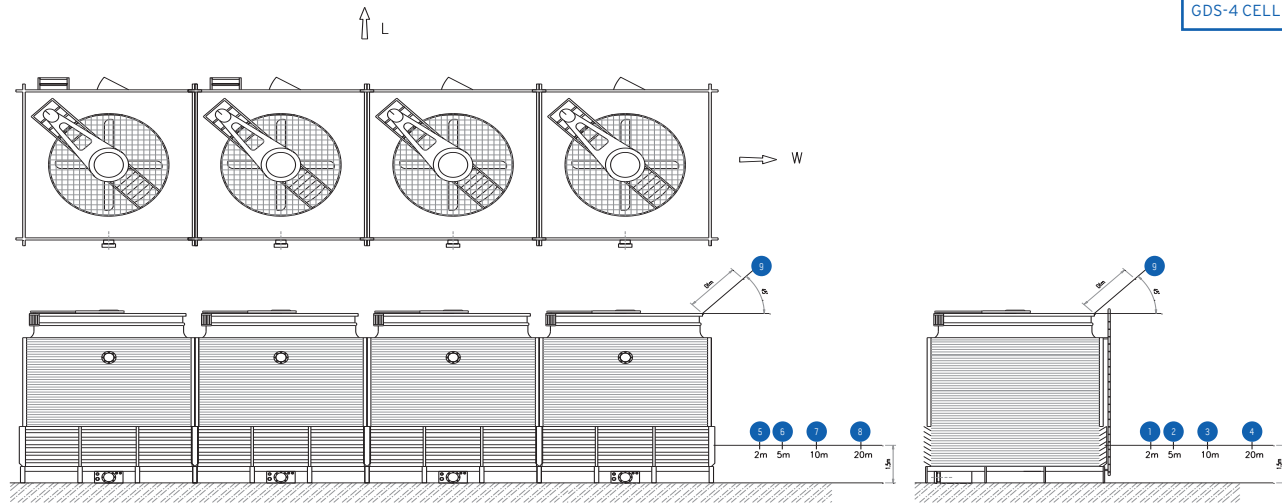


GDS-2 CELL



GDS-3 CELL

Model	SOUND LEVEL dB(A)									
	Louver (L)				Panel (W)				FAN (Dfm) (45°)	
	1	2	3	4	5	6	7	8	9	
GDS-2 CELL	GDS700-2B	78	73.5	70	65	77	72.5	68	63	78
	GDS800-2B	78	73.5	70.5	66	78	73	69.5	64	79
	GDS900-2B	79	74	71	66.5	79	74	70	65.5	81
	GDS1000-2B	81	75	72	67.5	84	74.5	71	66	82
	GDS1100-2B	82	76	72.5	68	81	75	72	67	83
	GDS1200-2B	83	77	74	69	82	76	73	68	84
	GDS1300-2B	83.5	77.5	74	69	82.5	76	73.5	68.5	83
	GDS1400-2B	83.5	77.5	74.5	69.5	82.5	76.5	73.5	68.5	83
	GDS1500-2B	84	78	75	69.5	83	76.5	73.5	69	83.5
	GDS1600-2B	84	78	75.5	70	83	77	74	69.5	84
	GDS1700-2B	84.5	78.5	75.5	70	83.5	77.5	74.5	69.5	84.5
	GDS1800-2B	83.5	79	74.5	69.5	83	76.5	73.5	69.5	84
	GDS1900-2B	84	78	75	69.5	83	77	74	70	84.5
	GDS2000-2B	84.5	78.5	75	70	83.5	76	74.5	70.5	84.5
	GDS2500-2B	84.5	79	75.5	70.5	83.5	76.5	75	71	85
	GDS2800-2B	85	79.5	76	71	84	77	75.5	71	85.5
GDS3000-2B	85.5	79.5	76.5	71.5	84.5	78	76	71.5	85.5	
GDS-3 CELL	GDS1050-3B	78.5	74	67.5	64	76.5	72	68	64	79
	GDS1200-3B	78.5	74	67.5	64.5	77	72.5	68	64	79.5
	GDS1350-3B	9	74.5	67.5	65	77	73	68.5	64.5	81
	GDS1500-3B	81.5	75	68	65.5	77	73	68.5	64.5	82
	GDS1650-3B	82.5	75.5	67.5	65	77.5	73.5	69	65	83.5
	GDS1800-3B	83.5	77.5	74.5	66	82	76	73.5	68.5	84.5
	GDS1950-3B	84	77.5	75	68	82.5	76.5	72	69	84.5
	GDS2100-3B	84	77.5	75.5	68.5	82.5	76	71	68	84.5
	GDS2250-3B	84.5	77.5	74	69.5	83.5	76	71.5	69	85
	GDS2400-3B	84.5	76	74.5	68.5	83.5	76.5	72	69.5	85.5
	GDS2550-3B	84.5	76.5	74.5	68.5	83.5	76.5	72	69.5	85
	GDS2700-3B	85	77	75	68.5	84	77	72.5	70	85
	GDS2850-3B	85	77.5	75	69	84	75	71	70.5	85.5
	GDS3000-3B	85.5	77.5	75	69.5	84	76	72	69.5	85.5
	GDS3750-3B	85.5	77.5	75.5	69.5	84.5	76.5	72.5	69.5	85.5
	GDS4200-3B	86	78	75.5	70	85	76	72.5	70	86
GDS4500-3B	86	78	76	70	85	76	73	70	86	



Model	SOUND LEVEL dB(A)								
	Louver (L)				Panel (W)				FAN (Dfm) (45°)
	1	2	3	4	5	6	7	8	9
GDS1400-4B	79	74.5	68	64	77	72.5	69	64.5	79.5
GDS1600-4B	79	74.5	68	64	77	73	69.5	65	79.5
GDS1800-4B	79.5	75	68	64.5	77.5	73	69.5	65	80
GDS2000-4B	81.5	73.5	68.5	65.5	77.5	73.5	69.5	65	81
GDS2200-4B	82.5	75.5	68	65.5	78.5	73.5	70	65.5	81.5
GDS2400-4B	83.5	77	72	66	82	75	72	66	83.5
GDS2600-4B	84	77.5	74	67	82.5	76.5	72.5	69	84.5
GDS2800-4B	84.5	77.5	75.5	68.5	82.5	76.5	72	69	85
GDS3000-4B	84.5	76	75.5	68.5	83	77	71	70	85.5
GDS3200-4B	84.5	76.5	75	69	83.5	77	72	70	85.5
GDS3400-4B	85	76.5	75	69	84	77	72.5	70	85.5
GDS3600-4B	85	77	75.5	69	84	77.5	73	68	86
GDS3800-4B	85.5	77.5	75.5	69.5	84	77.5	73	68	86
GDS4000-4B	85.5	77.5	75.5	70	84.5	78	73.5	69	86.5
GDS5000-4B	86	78	76	70.5	84.5	78.5	74	69.5	86.5
GDS5600-4B	86	78	76	71	84.5	79	74	69.5	87
GDS6000-4B	86.5	78.5	76.5	71	85.5	79	74.5	70	87

CALCULATION OF MAKE UP WATER

1. Evaporating Loss (E) kg/h

The evaporating quantity may be calculated by the equation below.

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

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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