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APPENDIX

Table 5: Table of Data

2 cm Covered copper tube with automatic system (Static Flow)								
Time	**Inlet Temp. (^{0}C)**	**Outlet Temp. (^{0}C)**	**Ambient Temp. (^{0}C)**	**Solar Insolation (W/m^2)**	**Humidity (%)**	**Wind (m/s)**		
10:30am	37	65	37	819	54	0.8		
11:00am	39	68	40	826	49	0.9		
11:30am	40	71	40	859	46	0.96		
12:00pm	37	48	38	218	57	2.11		
12:30pm	42	78	40	935	40	1.25		
1:00pm	44	100	40	964	41	0.95		
1:30pm	38	46	37	306	49	1.25		
2:00pm	34	44	37	284	50	1.03		
2:30pm	34	42	36	542	53	2.25		
3:00pm	34	42	36	565	51	0.88		
3:30pm	35	43	34	287	62	0.88		
4:00pm	32	33	31	209	76	0.97		
2nd								
2 cm Covered copper tube receiver manual								
Time	**Inlet Temp. (^{0}C)**	**Outlet Temp. (^{0}C)**	**Ambient Temp. (^{0}C)**	**Solar Insolation (W/m^2)**	**Humidity (%)**	**Wind (m/s)**		
10:00am	27	40	40	611	35	2.27		
10:30am	32	45	37	688	34	1.67		
11:00am	32	44	36	770	36	0.98		
11:30am	34	50	39	861	36	0.90		
12:00pm	35	61	46	894	40	0.85		
12:30pm	37	52	45	886	41	0.87		
1:00pm	38	52	37	910	41	0.88		
1:30pm	37	81	39	996	41	0.78		
2:00pm	38	47	38	539	40	0.90		
2:30pm	36	38	38	372	47	1.01		
3:00pm	37	36	38	239	45	1.03		
3:30pm	37	48	37	563	56	1.05		
4:00pm	38	45	38	567	50	1.03		
2 cm non-covered copper tube automatic								
Time	**Inlet Temp. (^{0}C)**	**Outlet Temp. (^{0}C)**	**Ambient Temp. (^{0}C)**	**Solar Insolation (W/m^2)**	**Humidity (%)**	**Wind (m/s)**		

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10:30am	25	25	32	305	74	-		
11:00am	30	37	35	424	61	-		
11:30am	39	27	34	345	61	-		
12:00pm	36	49	35	978	58	-		
12:30pm	36	44	36	941	54	-		
1:00pm	36	46	36	840	52	-		
1:30pm	38	37	34	782	53	-		
2:00pm	35	51	35	910	48	-		
2:30pm	35	53	36	880	46	-		
3:00pm	35	50	37	1025	44	-		
3:30pm	37	49	36	766	45	-		

2 cm Non-covered copper tube with manual system

Time	Inlet Temp. (^{0}C)	Outlet Temp. (^{0}C)	Ambient Temp. (^{0}C)	Solar Insolation (W/m^2)	Humidity (%)	Wind (m/s)		
10:30am	31	42	36	714	54	-		
11:00am	28	35	34	515	56	-		
11:30am	31	39	36	733	55	-		
12:00pm	32	25	31	100	74	-		
12:30pm	33	26	32	206	74	-		
1:00pm	32	46	35	865	60	-		
1:30pm	33	41	39	667	49	-		
2:00pm	31	33	36	375	57	-		
2:30pm	36	58	38	1166	50	-		
3:00pm	35	29	34	309	63	-		
3:30pm	32	25	34	253	63	-		

1 cm Covered copper tube with Automatic System (Static Flow)

Time	Inlet Temp. (^{0}C)	Outlet Temp. (^{0}C)	Ambient Temp. (^{0}C)	Solar Insolation (W/m^2)	Humidity (%)	Wind (m/s)		
10:00am	30	39	45	572	29	2.18		
10:30am	32	42	42	673	32	2.13		
11:00am	31	60	47	723	27	2.15		
11:30am	31	85	42	875	34	2.05		
12:00pm	36	89	40	932	34	1.96		
12:30pm	34	90	40	963	31	1.26		
1:00pm	35	99	39	965	32	1.17		
1:30pm	37	100	41	970	30	1.42		
2:00pm	38	98	38	943	31	1.46		
2:30pm	33	94	40	893	30	1.66		
3:00pm	37	98	39	945	32	1.33		

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Data for the water flow System								
2 cm Aluminum tube with automatic system								
Time	**Inlet Temp. (^{0}C)**	**Outlet Temp. (^{0}C)**	**Ambient Temp. (^{0}C)**	**Solar Insolation (W/m^2)**	**Humidity (%)**	**Wind (m/s^2)**	**Energy Absorbed (KJ/m^2)**	**Efficiency (%)**
10:00am	28	37	40	489	53	0	105	22.37
10:30am	31	48	42	650	38	0	178.5	28.61
11:00am	35	56	44	695	38	0.15	220.5	33.05
11:30am	36	61	44	749	35	0	262.5	36.51
12:00pm	38	68	43	783	42	0	315	41.9
12:30pm	37	60	37	561	45	0	241.5	44.84
1:00pm	37	64	41	835	39	0	283.5	35.37
1:30pm	39	70	46	935	33	0	325.5	36.26
2:00pm	40	72	46	923	32	0	336	37.92
2:30pm	37	75	41	871	32	0.28	399	47.72
3:00pm	38	67	44	800	33	0.34	304.5	39.65
2 cm Copper tube with automatic system								
	Inlet Temp. (^{0}C)	**Outlet Temp. (^{0}C)**	**Ambient Temp. (^{0}C)**	**Solar Insolation (W/m^2)**	**Humidity (%)**	**Wind (m/s^2)**	**Energy Absorbed (KJ/m^2)**	**Efficiency (%)**
10:00am	24	34	41	570	41	1.92	105	19.19
10:30am	31	54	43	665	35	2.03	210	32.89
11:00am	34	54	44	745	34	1.96	210	29.36
11:30am	36	57	43	824	34	1.95	220	27.87
12:00pm	36	55	39	719	38	1.93	199.5	28.9
12:30pm	39	67	40	930	31	1.93	294	32.93
1:00pm	40	78	40	959	37	1.91	399	43.34
1:30pm	42	80	42	963	28	1.92	399	43.16
2:00pm	33	59	43	782	30	1.79	273	36.37
2:30pm	35	63	42	949	43	1.84	294	32.27
3:00pm	35	49	37	457	32	1.74	147	33.51
2 cm copper tube with manual system								
Time	**Inlet Temp. (^{0}C)**	**Outlet Temp. (^{0}C)**	**Ambient Temp. (^{0}C)**	**Solar Insolation (W/m^2)**	**Humidity (%)**	**Wind m/s^2)**	**Energy Absorbed (KJ/m^2)**	**Efficiency (%)**
10:00am	27	34	34	385	67	2.62	73.5	19.89
10:30am	30	36	37	572	55	1.33	63	11.47
11:00am	31	48	38	628	49	1.54	178.5	29.61
11:30am	33	53	38	675	47	1.36	210	31.75

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12:00pm	37	69	40	849	45	1.28	336	41.22
12:30pm	36	74	39	821	49	1.28	399	50.62
1:00pm	37	62	38	711	49	1.34	262.5	38.46
1:30pm	38	49	37	683	40	1.24	115.5	17.62
2:00pm	35	47	36	428	55	1.16	126	30.67
2:30pm	36	51	40	810	39	1.22	157.5	20.25
3:00pm	35	55	38	692	46	1.31	210	31.61
3:30pm	35	50	36	523	47	1.31	157.5	31.37

2 cm Non-covered Copper tube with Automatic System

Time	Inlet Temp. (^{0}C)	Outlet Temp. (^{0}C)	Ambient Temp. (^{0}C)	Solar Insolation (W/m^2)	Humidity (%)	Wind m/s^2)	Energy Absorbed (KJ/m^2)	Efficiency (%)
10:30am	27	32	32	374	79	2.06	52.5	14.62
11:00am	28	39	32	336	72	2.02	115.5	35.81
11:30am	33	53	37	691	61	1.53	210	31.66
12:00pm	35	58	41	755	76	1.61	241.5	33.32
12:30pm	36	62	42	786	55	1.83	273	36.18
1:00pm	35	42	35	442	49	1.65	73.5	17.32
1:30pm	37	69	45	817	37	1.69	346.5	42.84
2:00pm	38	55	41	537	37	1.64	178.5	34.63
2:30pm	30	42	34	482	39	1.72	126	27.23
3:00pm	25	32	25	244	34	1.57	94.5	40.34

1 cm Covered copper tube with automatic system

Time	Inlet Temp. (^{0}C)	Outlet Temp. (^{0}C)	Ambient Temp. (^{0}C)	Solar Insolation (W/m^2)	Humidity (%)	Wind m/s^2)	Energy Absorbed (KJ/m^2)	Efficiency (%)
10:00am	29	41	41	555	45	0.13	126	23.65
10:30am	31	45	42	624	39	0	147	24.54
11:00am	33	52	43	719	38	0	199.5	28.9
11:30am	34	55	43	800	31	0	220.5	28.71
12:00pm	36	64	45	898	30	0.07	294	36.54
12:30pm	35	52	40	645	44	0.19	178.5	28.83
1:00pm	36	60	42	848	35	0.13	252	30.96
1:30pm	37	56	40	771	33	0	199.2	26.91
2:00pm	33	39	37	346	59	0.19	63	18.97
2:30pm	36	47	35	552	57	0	115.5	34.18
3:00pm	36	51	36	438	45	0	157.5	37.46

1 cm Covered copper tube with manual system

Time	Inlet Temp. (^{0}C)	Outlet Temp. (^{0}C)	Ambient Temp. (^{0}C)	Solar Insolation (W/m^2)	Humidity (%)	Wind m/s^2)	Energy Absorbed (KJ/m^2)	Efficiency (%)

10:00am	28	33	38	343	50	-	52.5	15.94
10:30am	32	47	42	727	36	-	157.5	22.57
11:00am	34	52	43	735	34	-	189	26.79
11:30am	38	66	44	887	34	-	294	34.53
12:00pm	35	59	43	834	37	-	252	31.47
12:30pm	35	42	35	305	35	-	73.5	25.1
1:00pm	37	68	43	1090	36	-	325.5	31.12
1:30pm	37	43	39	429	46	-	63	15.29
2:00pm	32	36	37	274	58	-	42	15.98
2:30pm	36	57	40	617	45	-	220.5	37.23
3:00pm	35	46	39	508	44	-	115.5	23.68

1 cm Non-covered copper tube with automatic system

Time	Inlet Temp. (^{0}C)	Outlet Temp. (^{0}C)	Ambient Temp. (^{0}C)	Solar Insolation (W/m^2)	Humidity (%)	Wind (m/s^2)	Energy Absorbed (KJ/m^2)	Efficiency (%)
10:00am	24	27	31	309	81	2.33	31.5	10.62
10:30am	29	36	38	532	55	2.21	73.5	14.39
11:00am	27	36	35	518	54	2.3	94.5	19
11:30am	31	38	39	523	41	2.35	73.5	14.64
12:00pm	32	48	37	857	45	2.42	168	20.42
12:30pm	34	50	37	873	43	2.52	168	20
1:00pm	35	54	37	951	42	2.5	199.5	21.85
1:30pm	37	61	39	958	37	2.54	283.5	26.83
2:00pm	36	53	38	883	43	2.61	178.5	21.06
2:30pm	34	48	43	727	33	2.5	147	21.06
3:00pm	36	53	40	823	37	1.9	178.5	22.59

1 cm Non-covered copper tube with manual system

Time	Inlet Temp. (^{0}C)	Outlet Temp. (^{0}C)	Ambient Temp. (^{0}C)	Solar Insolation (W/m^2)	Humidity (%)	Wind (m/s^2)	Energy Absorbed (KJ/m^2)	Efficiency (%)
10:00am	30	40	39	592	54	-	105	18.48
10:30am	34	43	40	745	50	-	94.5	13.21
11:00am	38	53	42	815	49	-	157.5	20.13
11:30am	34	49	38	821	55	-	157.5	19.98
12:00pm	42	58	42	1019	41	-	262.5	26.83
12:30pm	33	45	35	741	56	-	126	17.71
1:00pm	36	55	43	954	39	-	199.5	21.78
1:30pm	40	69	44	1166	38	-	304.5	27.2
2:00pm	35	46	36	695	54	-	115.5	17.31
2:30pm	34	40	39	466	48	-	63	14
3:00pm	35	42	39	485	57	-	73.5	15.79

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