

2021 ASHRAE Handbook - Fundamentals (SI)						BASE MARAMBIO, ANTARCTICA (WMO: 890550)											
Lat: 64.241S			Long: 56.625W			Elev: 200		StdP: 98.95			Time zone: -3.00 (W03)			Period: 94-19		WBAN: 99999	
Annual Heating, Humidification, and Ventilation Design Conditions																	
Coldest Month	Heating DB		Humidification DP/MCDB and HR						Coldest month WS/MCDB				MCWS/PCWD to 99.6% DB		WSF		
			99.6%			99%			0.4%		1%						
	99.6%	99%	DP	HR	MCDB	DP	HR	MCDB	WS	MCDB	WS	MCDB	MCWS	PCWD			
7	-29.5	-27.6	-32.7	0.2	-28.8	-30.6	0.2	-27.2	30.6	-18.6	28.0	-22.1	13.5	200	1.259		
Annual Cooling, Dehumidification, and Enthalpy Design Conditions																	
Hottest Month	Hottest Month DB Range	Cooling DB/MCWB						Evaporation WB/MCDB						MCWS/PCWD to 0.4% DB			
		0.4%		1%		2%		0.4%		1%		2%					
		DB	MCWB	DB	MCWB	DB	MCWB	WB	MCDB	WB	MCDB	WB	MCDB	MCWS	PCWD		
1	3.6	7.5	3.8	6.1	2.9	4.8	2.0	4.2	6.8	3.2	5.5	2.3	4.3	4.9	320		
Dehumidification DP/MCDB and HR									Enthalpy/MCDB						Extreme Max WB		
0.4%			1%			2%			0.4%		1%		2%				
DP	HR	MCDB	DP	HR	MCDB	DP	HR	MCDB	Enth	MCDB	Enth	MCDB	Enth	MCDB			
2.1	4.5	4.3	1.2	4.2	3.2	0.5	4.0	2.4	17.6	7.0	15.8	5.6	14.2	4.4	9.7		
Extreme Annual Design Conditions																	
Extreme Annual WS				Extreme Annual Temperature				n-Year Return Period Values of Extreme Temperature									
				Mean		Standard deviation		n=5 years		n=10 years		n=20 years		n=50 years			
1%	2.5%	5%		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max		
25.2	22.4	20.0	DB	-30.9	10.5	2.6	1.9	-32.7	11.9	-34.3	13.0	-35.7	14.0	-37.6	15.4		
			WB	-30.9	6.7	2.1	1.6	-32.5	7.8	-33.7	8.7	-34.9	9.6	-36.5	10.7		
Monthly Climatic Design Conditions																	
			Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Temperatures, Degree-Days and Degree-Hours	DBAvg	-8.0	-0.8	-1.7	-5.2	-10.5	-11.5	-14.8	-15.1	-13.4	-10.7	-7.1	-3.6	-1.4			
	DBStd	8.10	2.38	3.55	5.46	7.15	7.45	7.93	8.19	7.75	8.01	6.41	3.99	2.52			
	HDD10.0	6573	335	327	471	614	666	744	777	725	622	531	409	352			
	HDD18.3	9614	593	560	729	864	924	994	1036	983	872	789	659	611			
	CDD10.0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	CDD18.3	0	0	0	0	0	0	0	0	0	0	0	0	0			
	CDH23.3	0	0	0	0	0	0	0	0	0	0	0	0	0			
	CDH26.7	0	0	0	0	0	0	0	0	0	0	0	0	0			
Wind	WSAvg	8.4	6.3	7.1	8.1	8.7	8.4	9.5	9.3	9.2	9.5	8.9	8.2	7.3			
Precipitation	PrecAvg	851	63	70	92	75	68	53	60	67	77	90	78	59			
	PrecMax	1106	92	102	112	132	117	95	107	130	119	135	121	99			
	PrecMin	588	37	46	51	20	31	21	14	11	37	59	37	22			
	PrecStd	152	16	15	15	25	21	17	25	29	26	20	23	22			
	Monthly Design Dry Bulb and Mean Coincident Wet Bulb Temperatures	0.4%	DB	8.9	9.2	7.5	6.1	8.0	3.9	4.5	3.4	5.3	6.1	8.6	7.4		
MCWB			5.6	5.1	4.0	2.2	3.6	0.0	0.5	0.2	1.4	2.4	4.7	3.7			
2%		DB	6.5	6.9	5.5	3.2	4.3	1.5	1.2	1.1	3.1	3.9	5.4	5.2			
		MCWB	3.6	3.5	2.5	0.7	1.2	-0.4	-0.8	-1.0	0.5	1.2	2.5	2.4			
5%		DB	4.7	5.2	3.8	1.7	2.1	-0.2	-0.7	-0.6	1.7	2.6	3.3	3.8			
		MCWB	2.4	2.4	1.5	0.1	-0.1	-1.4	-1.8	-1.7	0.0	0.5	1.2	1.5			
10%		DB	3.0	3.7	2.2	0.1	-0.1	-1.9	-2.1	-2.0	0.3	1.4	1.8	2.5			
		MCWB	1.4	1.5	0.7	-0.9	-1.0	-2.7	-2.9	-2.8	-0.8	-0.1	0.3	0.8			
Monthly Design Wet Bulb and Mean Coincident Dry Bulb Temperatures	0.4%	WB	5.9	5.4	4.6	2.7	3.8	0.7	1.0	0.9	2.2	3.0	4.9	4.2			
		MCDB	8.2	8.7	6.8	5.4	7.6	2.1	3.2	2.5	4.2	5.4	8.6	6.7			
	2%	WB	3.8	3.9	2.9	1.2	1.6	-0.3	-0.5	-0.6	0.9	1.6	2.8	2.7			
		MCDB	6.1	6.4	5.1	2.7	3.8	1.3	0.9	0.5	2.5	3.3	5.1	4.7			
	5%	WB	2.6	2.7	1.7	0.1	0.1	-1.3	-1.7	-1.7	0.1	0.7	1.4	1.8			
		MCDB	4.3	4.9	3.4	1.5	1.6	-0.3	-0.7	-0.7	1.4	2.2	3.0	3.5			
	10%	WB	1.5	1.7	0.7	-1.0	-1.1	-2.7	-2.9	-2.8	-0.8	-0.1	0.3	0.9			
		MCDB	2.9	3.5	2.1	0.2	0.0	-1.8	-2.0	-1.9	0.4	1.3	1.6	2.3			

Mean Daily Temperature Range		MDBR	3.6	4.3	5.3	6.2	7.1	6.4	7.5	7.3	7.3	5.9	4.6	3.7
	5% DB	MCDBR	6.5	7.0	6.9	7.9	7.4	7.7	8.5	8.4	7.6	6.5	6.6	6.0
		MCWBR	4.5	4.9	5.1	6.3	5.3	6.7	7.5	7.3	6.0	4.9	4.9	4.1
	5% WB	MCDBR	6.3	6.7	6.5	8.0	7.5	7.7	8.5	8.4	7.1	6.3	6.2	5.7
		MCWBR	4.6	5.0	5.1	7.0	6.2	7.0	7.8	7.7	6.0	4.9	4.9	4.1
Clear Sky Solar Irradiance	taub		0.278	0.272	0.258	0.225	0.152	0.139	0.142	0.213	0.244	0.262	0.266	0.275
	taud		2.440	2.453	2.454	2.331	1.993	1.933	1.956	2.243	2.306	2.326	2.375	2.373
	Ebn at noon		994	948	872	715	467	220	461	709	864	947	1000	1008
	Edn at noon		101	88	69	46	22	9	21	48	77	98	106	111
All-Sky Solar Radiation	RadAvg		6.26	4.47	2.52	1.03	0.25	0.06	0.15	0.73	2.23	4.35	6.37	7.23
	RadStd		0.64	0.42	0.31	0.09	0.02	0.00	0.01	0.06	0.12	0.17	0.32	0.71
Historical Trends														
		DBAvg	Heating		Cooling			Degree-Days						
			99% DB	99% DP	1% DB	1% WB	1% DP	HDD10.0	HDD18.3	CDD10.0	CDD18.3			
Station Only		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Regional (0 neighbors)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			

CDDn	Cooling degree-days base n°C, °C-day	Lat	Latitude, °	Period	Years used to calculate the design conditions
CDHn	Cooling degree-hours base n°C, °C-hour	Long	Longitude, °	Sd	Standard deviation of daily average temperature, °C
DB	Dry bulb temperature, °C	MCDB	Mean coincident dry bulb temperature, °C	StdP	Standard pressure at station elevation, kPa
DP	Dew point temperature, °C	MCDBR	Mean coincident dry bulb temp. range, °C	taub	Clear sky optical depth for beam irradiance
Ebn,noon	Clear sky beam normal and diffuse horizontal irradiances at solar noon, W/m2	MCDP	Mean coincident dew point temperature, °C	taud	Clear sky optical depth for diffuse irradiance
Edh,noon		MCWB	Mean coincident wet bulb temperature, °C	Tavg	Average temperature, °C
Elev	Elevation, m	MCWBR	Mean coincident wet bulb temp. range, °C	Time Zone	Hours ahead or behind UTC
Enth	Enthalpy, kJ/kg	MCWS	Mean coincident wind speed, m/s	WB	Wet bulb temperature, °C
HDDn	Heating degree-days base n°C, °C-day	MDBR	Mean dry bulb temp. range, °C	Hours 8/4 & 12.8/20.6	Number of hours between 8 a.m. and 4 p.m with DB between 12.8 and 20.6 °C
PCWD	Prevailing coincident wind direction, °,0 = North, 90 = East	WS	Wind speed, m/s	HR	Humidity ratio, g of moisture per kg of dry air