

2021 ASHRAE Handbook - Fundamentals (SI)																	
SAN MARTIN, ARGENTINA (WMO: 874160)																	
Lat:33.0733S			Long:68.465W			Elev:653		StdP: 93.72			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	-0.6	0.8	-8.7	1.9	7.9	-6.9	2.3	7.5	9.2	11.8	7.4	9.7	0.8	230	0.372		
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	11.4	35.1	20.9	33.7	20.5	32.4	20.2	23.2	31.7	22.3	30.8	21.5	29.7	2.7	50		
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			
20.6	16.5	27.9	19.6	15.5	27.1	18.7	14.6	26.2	72.9	31.6	69.1	30.8	66.0	29.8	28.0		
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		
8.7	7.2	6.6	DB	-2.8	38.3	1.3	1.6	-3.7	39.4	-4.5	40.3	-5.3	41.2	-6.2	42.3		
			WB	-4.1	25.3	1.2	1.2	-5.0	26.2	-5.7	26.8	-6.3	27.5	-7.2	28.3		
Monthly Climatic Design Conditions																	
			Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Temperatures, Degree-Days and Degree-Hours	DBAvg	17.6	25.9	24.3	21.4	16.9	12.9	9.5	8.9	11.5	14.8	18.9	22.1	24.7			
	DBStd	6.73	2.98	3.31	3.32	3.44	3.15	2.58	3.04	3.69	3.91	3.76	3.50	3.27			
	HDD10.0	139	0	0	0	2	11	37	57	25	7	1	0	0			
	HDD18.3	1186	1	3	11	66	171	263	293	213	117	38	9	2			
	CDD10.0	2919	492	399	353	209	99	24	22	73	151	277	363	457			
	CDD18.3	924	234	169	106	23	1	0	0	3	11	56	122	201			
	CDH23.3	8490	2390	1509	748	132	11	0	1	32	103	458	1052	2054			
	CDH26.7	3460	1110	623	236	18	1	0	0	6	19	133	393	922			
Wind		WSAvg	1.8	2.0	1.9	1.7	1.5	1.3	1.3	1.5	1.8	2.0	2.2	2.3	2.1		
Precipitation	PrecAvg	168	33	38	26	8	4	4	3	2	9	6	17	27			
	PrecMax	292	117	104	84	30	28	42	19	21	49	30	58	85			
	PrecMin	82	3	0	0	0	0	0	0	0	0	0	0	1			
	PrecStd	61	24	33	22	9	7	8	5	4	12	8	17	25			
Monthly Design Dry Bulb and Mean Coincident Wet Bulb Temperatures	0.4%	DB	37.3	35.7	32.9	28.8	24.8	20.3	21.7	27.2	29.0	32.6	34.7	36.7			
		MCWB	21.6	22.3	21.2	18.6	16.1	12.1	11.7	15.0	16.4	17.8	19.1	20.6			
	2%	DB	35.1	33.7	31.1	26.6	22.4	18.2	18.6	23.1	26.1	29.9	32.6	34.7			
		MCWB	21.4	21.2	20.6	17.2	14.9	11.0	10.4	13.0	14.5	17.1	18.6	20.3			
	5%	DB	33.6	32.1	29.3	24.6	20.2	16.6	16.6	20.5	24.0	27.9	30.7	33.3			
		MCWB	21.0	20.9	19.9	16.5	13.5	10.1	9.2	11.6	13.6	16.1	18.0	20.0			
	10%	DB	32.0	30.6	27.5	22.7	18.3	14.8	14.6	18.2	21.7	25.9	29.0	31.5			
		MCWB	20.6	20.4	19.2	15.8	12.5	9.2	8.1	10.2	12.4	15.2	17.4	19.4			
Monthly Design Wet Bulb and Mean Coincident Dry Bulb Temperatures	0.4%	WB	24.9	24.3	23.5	20.7	17.6	13.4	13.2	16.6	17.8	20.0	21.2	23.4			
		MCDB	33.8	31.6	30.7	26.0	23.1	18.5	19.8	24.7	26.3	29.2	30.6	32.9			
	2%	WB	23.3	23.0	21.9	18.7	15.8	11.8	11.0	13.7	15.5	18.5	20.0	22.1			
		MCDB	32.1	31.1	28.5	23.8	20.6	16.7	17.1	22.0	24.5	27.2	29.8	32.0			
	5%	WB	22.3	22.0	20.9	17.6	14.5	10.7	9.7	12.0	14.2	17.0	19.0	21.1			
		MCDB	31.2	29.9	27.3	22.9	18.9	15.5	15.6	19.7	22.7	25.8	28.8	30.6			
	10%	WB	21.4	21.2	19.9	16.5	13.3	9.6	8.5	10.7	13.0	15.9	18.1	20.2			
		MCDB	30.2	28.5	26.3	21.6	17.4	14.0	13.9	17.5	20.5	24.4	27.3	29.5			

Mean Daily Temperature Range		MDBR	11.4	11.0	10.6	10.5	10.4	11.2	11.7	12.0	11.6	11.8	11.9	11.9
	5% DB	MCDBR	13.6	13.5	13.2	13.2	13.0	13.5	14.1	15.1	15.0	14.7	14.7	14.4
		MCWBR	4.9	4.6	5.4	6.4	7.0	8.0	8.0	8.1	7.2	6.1	5.7	5.3
	5% WB	MCDBR	12.0	11.4	11.3	11.5	11.5	12.3	13.3	14.7	13.8	13.0	13.1	12.6
		MCWBR	5.5	4.9	5.2	6.1	6.7	7.8	7.9	8.3	7.2	6.1	5.7	5.3
Clear Sky Solar Irradiance	taub		0.394	0.388	0.368	0.362	0.325	0.302	0.298	0.323	0.364	0.366	0.374	0.389
	taud		2.363	2.387	2.441	2.416	2.478	2.550	2.514	2.432	2.315	2.344	2.347	2.345
	Ebn at noon		944	929	912	858	843	845	867	887	900	940	957	953
	Edn at noon		131	123	109	100	83	73	79	96	122	127	132	134
All-Sky Solar Radiation	RadAvg		7.87	6.86	5.63	4.29	3.10	2.85	3.12	4.05	5.32	6.66	7.83	8.27
	RadStd		0.43	0.43	0.38	0.41	0.36	0.22	0.21	0.27	0.37	0.57	0.47	0.44
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	+0.48	+0.41	N/A	N/A	N/A	N/A	N/A	+63		

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