

2021 ASHRAE Handbook - Fundamentals (SI)

BAHIA BLANCA, ARGENTINA (WMO: 877500)																
Lat: <b>38.7147S</b>			Long: <b>62.1631W</b>			Elev: <b>83</b>		StdP: <b>100.33</b>		Time zone: <b>-3.00 (W03)</b>			Period: <b>94-19</b>		WBAN: <b>99999</b>	
Annual Heating, Humidification, and Ventilation Design Conditions																
Coldest Month	Heating DB		Humidification DP/MCDB and HR						Coldest month WS/MCDB				MCWS/PCWD		WSF	
			99.6%			99%			0.4%		1%		to 99.6% DB			
	99.6%	99%	DP	HR	MCDB	DP	HR	MCDB	WS	MCDB	WS	MCDB	MCWS	PCWD		
7	-2.2	-0.8	-7.3	2.0	6.7	-5.8	2.3	6.2	19.2	13.2	16.5	11.7	3.3	320	0.667	
Annual Cooling, Dehumidification, and Enthalpy Design Conditions																
Hottest Month	Hottest Month DB Range	Cooling DB/MCWB						Evaporation WB/MCDB						MCWS/PCWD		
		0.4%		1%		2%		0.4%		1%		2%		to 0.4% DB		
		DB	MCWB	DB	MCWB	DB	MCWB	WB	MCDB	WB	MCDB	WB	MCDB	MCWS	PCWD	
1	13.9	35.3	20.4	33.8	19.9	32.0	19.4	22.9	30.8	21.9	29.5	21.0	28.6	8.3	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		
20.6	15.5	26.0	19.6	14.5	24.9	18.7	13.7	24.0	68.3	31.0	64.5	29.4	61.3	28.8	28.4	
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	
15.3	13.9	12.5	DB	-5.0	38.6	1.8	1.3	-6.3	39.5	-7.4	40.2	-8.4	41.0	-9.7	41.9	
			WB	-5.6	25.0	1.8	1.0	-6.9	25.7	-8.0	26.3	-9.0	26.9	-10.3	27.7	
Monthly Climatic Design Conditions																
			Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Temperatures, Degree-Days and Degree-Hours	DBAvg	15.7	23.5	22.2	19.7	15.5	12.0	8.9	8.4	10.0	12.2	15.2	18.8	21.9		
	DBStd	6.37	3.50	3.82	3.85	3.69	3.61	3.22	3.50	3.76	3.83	3.66	3.76	3.81		
	HDD10.0	221	0	0	0	2	18	57	75	46	19	3	0	0		
	HDD18.3	1538	3	9	29	99	199	282	309	258	188	112	38	11		
	CDD10.0	2285	419	341	300	168	81	25	24	47	84	163	264	368		
	CDD18.3	561	163	117	72	15	3	0	0	1	3	13	53	121		
	CDH23.3	6254	1877	1242	704	136	18	0	1	12	36	166	636	1426		
	CDH26.7	2632	897	553	252	28	2	0	0	2	4	37	218	638		
Wind	WSAvg	6.2	7.1	6.5	6.0	5.7	5.4	5.9	5.9	6.0	6.1	6.2	6.5	7.0		
Precipitation	PrecAvg	624	62	68	79	58	40	25	29	30	47	71	64	64		
	PrecMax	1093	169	249	261	211	112	101	90	138	122	227	241	211		
	PrecMin	331	2	1	12	2	0	0	0	0	0	1	5	0		
	PrecStd	141	40	54	52	48	31	24	25	29	32	48	39	50		
Monthly Design Dry Bulb and Mean Coincident Wet Bulb Temperatures	0.4%	DB	37.8	36.7	34.9	29.5	26.0	20.0	21.1	24.6	26.8	30.1	34.1	37.0		
		MCWB	20.9	21.3	21.1	18.6	17.8	13.4	13.6	15.3	15.7	18.2	18.9	21.0		
	2%	DB	35.4	34.3	31.8	27.0	22.2	17.8	18.1	21.2	24.0	27.2	31.4	34.7		
		MCWB	20.5	20.7	20.1	17.8	15.8	12.0	11.8	13.0	14.4	16.8	18.0	19.6		
	5%	DB	33.6	32.2	29.5	24.5	19.9	16.1	16.2	19.0	21.9	25.0	29.1	32.5		
		MCWB	20.1	20.0	19.3	16.7	14.5	10.9	10.7	11.9	13.2	15.8	17.3	18.9		
	10%	DB	31.8	30.2	27.3	22.2	18.0	14.6	14.6	16.9	19.8	22.9	27.1	30.2		
		MCWB	19.5	19.3	18.1	15.6	13.4	10.3	9.8	10.7	12.0	14.7	16.3	18.0		
Monthly Design Wet Bulb and Mean Coincident Dry Bulb Temperatures	0.4%	WB	24.1	24.1	23.3	21.3	19.2	15.1	16.0	17.5	17.6	20.3	20.9	23.6		
		MCDB	32.6	31.8	30.1	25.1	22.9	18.1	19.0	21.9	23.4	26.8	29.1	32.0		
	2%	WB	22.7	22.7	21.7	19.2	17.3	13.5	13.4	14.2	15.8	18.4	19.6	21.8		
		MCDB	31.0	30.2	28.7	24.2	20.7	16.0	16.1	19.0	21.8	24.5	27.7	30.5		
	5%	WB	21.5	21.7	20.6	18.0	15.6	12.1	11.8	12.7	14.3	16.9	18.5	20.6		
		MCDB	30.0	28.6	27.1	22.7	18.8	14.8	15.3	17.6	19.9	22.7	26.3	28.9		
	10%	WB	20.6	20.8	19.5	16.7	14.1	10.8	10.3	11.3	13.0	15.7	17.5	19.4		
		MCDB	28.7	27.4	25.3	21.0	17.0	13.9	13.6	15.8	18.6	21.4	24.8	27.4		

Mean Daily Temperature Range		MDBR	13.9	13.1	12.5	11.7	10.4	10.3	10.6	11.3	12.3	12.4	13.6	14.1
	5% DB	MCDBR	16.4	15.8	14.6	14.4	12.3	11.6	12.4	13.4	14.9	15.7	16.2	16.9
		MCWBR	6.4	6.2	6.3	7.2	7.0	7.1	7.5	7.5	7.8	7.8	6.9	6.7
	5% WB	MCDBR	14.4	13.0	12.7	11.8	10.4	9.7	10.6	11.9	13.1	13.5	14.0	14.5
		MCWBR	6.6	6.2	6.6	6.8	6.7	6.8	7.3	7.3	7.8	7.8	6.9	6.7
Clear Sky Solar Irradiance	taub	0.394	0.381	0.366	0.360	0.336	0.321	0.323	0.366	0.399	0.380	0.380	0.394	
	taud	2.347	2.388	2.435	2.404	2.442	2.484	2.465	2.314	2.223	2.326	2.349	2.322	
	Ebn at noon	937	924	896	831	789	774	797	808	844	915	945	942	
	Edn at noon	131	120	106	95	79	70	76	102	128	127	130	136	
All-Sky Solar Radiation	RadAvg	7.83	6.69	5.26	3.65	2.37	1.98	2.14	2.95	4.23	5.54	7.14	8.00	
	RadStd	0.30	0.27	0.23	0.34	0.19	0.19	0.18	0.33	0.26	0.40	0.38	0.43	
Historical Trends														

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