

2021 ASHRAE Handbook - Fundamentals (SI)																
ROSARIO, ARGENTINA (WMO: 874800)																
Lat:32.9081S		Long:60.7822W		Elev:25		StdP: 101.03			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	-0.4	1.1	-4.9	2.5	6.9	-3.0	2.9	7.0	10.9	13.9	9.9	14.5	1.3	180	0.427	
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	11.5	34.5	23.3	33.1	22.9	31.9	22.5	25.8	31.3	24.9	30.1	24.1	29.2	4.8	0	
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		
24.2	19.2	28.7	23.2	18.1	27.8	22.4	17.2	27.0	80.1	31.1	76.1	30.1	72.7	29.2	30.9	
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	
10.1	8.7	7.6	DB	-3.6	37.5	1.4	1.3	-4.6	38.5	-5.4	39.2	-6.2	40.0	-7.2	41.0	
			WB	-4.2	28.1	1.3	1.3	-5.2	29.0	-5.9	29.8	-6.7	30.5	-7.6	31.4	
Monthly Climatic Design Conditions																
			Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Temperatures, Degree-Days and Degree-Hours	DBAvg	17.9	24.8	23.4	21.5	18.0	14.7	11.6	10.9	12.6	15.1	18.2	21.2	23.6		
	DBStd	5.92	2.79	3.07	3.24	3.68	3.80	3.82	4.08	4.29	3.91	3.42	3.12	3.02		
	HDD10.0	87	0	0	0	1	4	23	36	20	4	0	0	0		
	HDD18.3	980	1	2	9	49	127	206	233	187	112	44	9	2		
	CDD10.0	2982	458	377	357	240	148	71	64	100	156	254	335	422		
	CDD18.3	834	201	145	107	39	13	4	4	8	14	40	94	165		
	CDH23.3	7969	2114	1371	909	279	64	10	21	74	149	368	919	1691		
	CDH26.7	3013	927	533	295	63	8	1	2	17	39	102	321	705		
Wind		WSAvg	3.4	3.2	3.0	2.9	3.0	2.8	3.0	3.3	3.6	4.0	4.1	3.9	3.5	
Precipitation	PrecAvg	1007	109	116	155	96	52	34	31	36	57	107	105	122		
	PrecMax	1625	238	394	509	265	272	134	112	151	238	331	234	333		
	PrecMin	667	9	5	24	1	0	0	0	0	1	6	17	30		
	PrecStd	211	60	88	99	62	48	33	27	38	48	65	56	69		
Monthly Design Dry Bulb and Mean Coincident Wet Bulb Temperatures	0.4%	DB	37.0	35.1	33.7	31.1	27.9	24.9	26.0	29.0	30.9	32.1	34.1	36.1		
		MCWB	23.8	24.1	24.1	23.1	20.9	20.1	18.7	20.4	20.6	20.8	21.6	23.5		
	2%	DB	34.8	33.2	31.5	28.3	25.0	21.8	22.4	25.2	27.0	29.3	32.0	34.0		
		MCWB	23.4	23.9	22.9	20.9	19.6	18.1	17.2	18.1	18.7	20.0	21.0	22.7		
	5%	DB	33.0	31.9	29.9	26.4	22.9	19.8	19.9	22.6	24.8	27.1	30.1	32.2		
		MCWB	23.0	23.6	22.3	20.1	18.5	16.4	15.2	16.3	16.9	19.0	20.2	22.1		
	10%	DB	31.4	30.0	28.1	24.7	21.0	18.0	17.8	20.1	22.5	25.1	28.2	30.8		
		MCWB	22.5	22.7	21.3	19.3	17.2	14.6	13.9	14.7	15.7	17.9	19.4	21.6		
Monthly Design Wet Bulb and Mean Coincident Dry Bulb Temperatures	0.4%	WB	26.8	27.0	26.4	24.5	22.1	20.8	19.9	21.2	22.0	23.7	24.1	26.6		
		MCDB	32.8	32.8	31.4	28.7	25.9	23.7	23.9	26.9	28.7	28.9	30.7	32.2		
	2%	WB	25.5	25.7	24.7	22.9	20.5	19.0	18.0	19.4	20.0	21.7	22.5	24.9		
		MCDB	31.5	30.7	28.9	26.5	23.6	20.9	21.6	24.2	25.4	26.5	28.8	30.3		
	5%	WB	24.6	24.6	23.3	21.6	19.3	17.4	16.5	17.7	18.4	20.4	21.5	23.8		
		MCDB	30.4	29.4	27.6	24.8	22.2	19.2	19.3	21.4	22.5	25.3	27.5	29.3		
	10%	WB	23.8	23.6	22.3	20.4	18.0	15.5	15.0	15.7	16.9	19.2	20.6	22.7		
		MCDB	29.1	28.3	26.5	23.2	20.4	17.1	16.9	18.8	21.1	23.6	26.2	28.1		

Mean Daily Temperature Range		MDBR	11.5	10.7	10.9	10.6	9.9	10.2	10.9	11.9	11.9	11.2	11.8	11.7
	5% DB	MCDBR	13.7	12.7	12.9	12.9	11.5	11.0	12.9	14.5	14.8	14.2	14.5	14.2
		MCWBR	5.4	5.3	5.7	6.5	6.5	7.1	7.7	8.0	7.4	6.8	6.2	5.6
	5% WB	MCDBR	11.2	10.4	10.5	9.7	9.6	8.3	10.5	11.6	11.7	11.6	12.3	11.3
		MCWBR	5.3	5.3	5.4	5.8	5.8	6.3	7.0	7.0	7.4	6.8	6.2	5.6
Clear Sky Solar Irradiance	taub		0.406	0.397	0.373	0.378	0.358	0.354	0.355	0.418	0.475	0.423	0.399	0.399
	taud		2.354	2.393	2.458	2.414	2.427	2.426	2.397	2.176	2.019	2.239	2.334	2.360
	Ebn at noon		933	921	908	843	805	781	798	784	792	885	933	944
	Edn at noon		132	123	108	101	88	83	90	125	164	142	134	132
All-Sky Solar Radiation	RadAvg		7.16	6.16	5.25	3.82	2.81	2.40	2.64	3.53	4.68	5.65	6.84	7.27
	RadStd		0.40	0.49	0.47	0.47	0.25	0.28	0.28	0.34	0.39	0.49	0.41	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	+0.18	+0.59	+0.63	N/A	N/A	N/A	N/A				
Regional (0 neighbors)	N/A	N/A	N/A	+0.35	+0.50	+0.54	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