

2021 ASHRAE Handbook - Fundamentals (SI)																	
RIO GRANDE, ARGENTINA (WMO: 879340)																	
Lat:53.7803S			Long:67.7586W			Elev:22		StdP: 101.06			Time zone:-3.00 (W03)			Period:98-19		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			
6	-7.4	-5.9	-9.8	1.6	-7.3	-7.8	1.9	-5.5	14.6	4.7	13.5	4.2	2.5	230	0.926		
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	9.6	19.8	14.7	18.0	13.0	16.7	12.3	15.1	18.8	13.7	17.1	12.6	15.8	11.2	270		
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			
13.1	9.4	17.2	11.8	8.7	15.6	10.8	8.1	14.2	42.0	18.9	38.7	17.3	35.6	15.8	20.0		
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	
17.0	14.9	13.6	DB	-11.3	23.4	2.4	1.7	-13.0	24.6	-14.4	25.6	-15.8	26.6	-17.5	27.8		
			WB	-11.8	17.9	2.8	1.3	-13.8	18.9	-15.4	19.6	-16.9	20.4	-18.9	21.3		
Monthly Climatic Design Conditions																	
			Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Temperatures, Degree-Days and Degree-Hours	DBAvg	5.9	10.9	10.7	8.5	6.0	3.1	0.7	1.0	2.1	4.2	6.2	8.1	10.1			
	DBStd	4.35	2.21	2.86	2.50	2.48	2.87	3.28	2.52	2.09	2.27	2.19	2.31	1.96			
	HDD10.0	1619	16	22	61	122	216	278	279	244	175	119	64	23			
	HDD18.3	4526	232	213	306	371	473	528	537	503	425	376	306	256			
	CDD10.0	135	42	42	13	1	0	0	0	0	0	2	8	26			
	CDD18.3	0	0	0	0	0	0	0	0	0	0	0	0	0			
	CDH23.3	6	3	3	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	6.8	8.6	7.7	7.1	6.5	5.2	4.8	5.2	5.9	6.1	7.5	8.3	8.6		
Precipitation	PrecAvg	325	32	23	28	35	33	35	23	17	17	16	27	33			
	PrecMax	486	69	63	77	70	75	109	62	43	44	38	63	74			
	PrecMin	213	13	5	7	2	6	12	4	0	2	1	4	8			
	PrecStd	77	17	15	16	18	19	26	18	12	12	10	17	18			
	Monthly Design Dry Bulb and Mean Coincident Wet Bulb Temperatures	0.4%	DB	21.1	23.8	19.1	15.0	12.1	9.9	8.1	9.9	13.9	16.1	18.2	19.9		
MCWB			15.2	17.2	14.5	11.4	9.6	8.5	6.5	7.2	9.8	11.7	13.1	13.7			
2%		DB	18.9	20.2	16.1	13.1	10.0	7.9	6.2	7.9	11.2	14.1	16.2	17.9			
		MCWB	13.7	15.7	12.3	10.1	8.1	6.7	5.1	5.5	7.7	9.5	11.6	12.3			
5%		DB	17.1	18.1	14.9	12.0	8.8	6.2	5.2	6.2	9.9	12.9	14.9	16.2			
		MCWB	12.6	13.7	11.2	9.3	7.3	5.5	4.3	4.5	6.6	8.6	10.3	11.4			
10%		DB	15.9	16.1	13.2	10.8	7.8	5.1	4.8	5.2	8.2	11.1	13.1	15.0			
		MCWB	11.6	12.4	10.2	8.7	6.7	4.4	3.9	4.0	5.7	7.5	9.3	10.7			
Monthly Design Wet Bulb and Mean Coincident Dry Bulb Temperatures	0.4%	WB	15.8	17.9	15.1	11.8	10.1	8.5	6.5	7.2	10.1	11.7	14.0	14.2			
		MCDB	20.2	22.3	18.6	14.1	11.4	9.4	7.5	8.8	13.4	15.9	18.1	18.6			
	2%	WB	14.3	16.0	12.9	10.7	8.3	6.6	5.2	5.7	8.2	10.1	11.9	13.0			
		MCDB	18.1	19.6	15.4	12.7	9.4	7.2	5.8	7.0	10.6	13.3	15.8	16.8			
	5%	WB	13.1	14.4	11.5	9.9	7.4	5.5	4.5	4.8	6.8	8.9	10.6	11.8			
		MCDB	16.4	17.7	14.0	11.3	8.2	6.1	5.0	5.8	9.0	12.1	14.0	15.5			
	10%	WB	11.9	12.8	10.7	8.9	6.4	4.4	3.7	4.1	5.9	7.9	9.8	11.0			
		MCDB	15.3	15.7	12.7	10.4	7.3	5.0	4.3	5.1	7.7	10.6	12.9	14.3			

Mean Daily Temperature Range		MDBR	9.6	9.6	9.1	8.5	7.4	5.8	5.6	6.4	7.9	9.2	9.3	9.6
	5% DB	MCDBR	10.8	12.0	10.4	9.5	8.2	6.0	5.7	7.5	9.6	11.1	11.1	11.4
		MCWBR	7.2	8.0	7.5	7.3	6.7	5.3	4.9	5.9	6.8	7.4	7.4	7.4
	5% WB	MCDBR	10.4	11.4	9.6	8.9	7.3	5.8	5.2	6.9	8.8	10.4	10.7	10.9
		MCWBR	7.8	8.2	7.5	7.3	6.4	5.3	4.7	5.7	6.8	7.4	7.4	7.4
Clear Sky Solar Irradiance	taub		0.319	0.313	0.312	0.302	0.285	0.270	0.281	0.299	0.309	0.314	0.319	0.322
	taud		2.553	2.575	2.562	2.550	2.457	2.364	2.420	2.491	2.520	2.516	2.514	2.523
	Ebn at noon		984	953	890	790	669	597	659	776	877	941	978	990
	Edn at noon		99	90	79	62	48	42	48	64	80	94	102	104
All-Sky Solar Radiation	RadAvg		5.73	4.76	3.15	1.80	0.92	0.58	0.72	1.44	2.73	4.35	5.58	6.14
	RadStd		0.28	0.23	0.23	0.10	0.07	0.04	0.05	0.10	0.18	0.17	0.28	0.36
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