

2021 ASHRAE Handbook - Fundamentals (SI)																	
COMODORO RIVADAVIA, ARGENTINA (WMO: 878600)																	
Lat:45.7922S			Long:67.4619W			Elev:46		StdP: 100.77			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	-1.2	0.0	-13.1	1.2	14.7	-10.9	1.5	12.9	18.0	11.3	16.2	11.2	3.7	270	0.698		
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	11.2	31.0	16.1	28.9	15.4	27.1	14.6	17.8	27.1	16.7	25.5	15.8	24.1	8.1	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			
14.8	10.6	19.7	13.3	9.6	18.7	12.1	8.8	18.0	50.5	27.0	47.0	25.7	44.3	24.2	22.7		
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		
16.4	14.4	13.0	DB	-3.8	35.4	1.6	2.1	-4.9	36.9	-5.8	38.1	-6.7	39.3	-7.8	40.8		
			WB	-4.8	19.9	1.3	1.5	-5.8	21.0	-6.6	21.9	-7.3	22.7	-8.3	23.8		
Monthly Climatic Design Conditions																	
			Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Temperatures, Degree-Days and Degree-Hours	DBAvg	13.3	19.5	18.6	16.6	13.6	10.3	7.6	7.2	8.5	10.3	13.1	15.7	18.3			
	DBStd	5.53	3.35	3.77	3.59	3.51	3.51	3.53	3.50	3.28	3.52	3.45	3.45	3.43			
	HDD10.0	354	0	0	1	7	39	88	100	69	38	12	1	0			
	HDD18.3	2054	26	38	76	146	250	322	346	306	241	167	93	44			
	CDD10.0	1542	295	242	207	117	48	16	12	21	48	106	173	257			
	CDD18.3	199	62	47	23	6	1	0	0	0	1	3	14	42			
	CDH23.3	1732	547	432	192	34	1	0	0	0	5	24	132	364			
	CDH26.7	497	170	147	47	4	0	0	0	0	0	2	28	97			
Wind		WSAvg	6.0	6.9	6.0	5.6	5.8	5.2	5.6	5.5	5.6	5.6	6.1	6.8	7.0		
Precipitation	PrecAvg	237	14	16	19	28	33	32	23	22	16	13	11	12			
	PrecMax	442	74	90	96	155	150	170	131	84	92	58	53	112			
	PrecMin	123	0	0	0	0	0	2	0	1	0	0	0	0			
	PrecStd	76	17	19	21	33	33	33	24	22	16	12	13	17			
Monthly Design Dry Bulb and Mean Coincident Wet Bulb Temperatures	0.4%	DB	33.6	34.1	30.8	27.0	21.8	18.2	17.9	19.5	23.8	26.1	30.0	32.1			
		MCWB	17.2	18.3	16.1	14.2	12.3	9.6	9.8	10.3	11.5	13.2	15.3	16.2			
	2%	DB	30.8	30.7	27.8	23.9	19.3	15.9	15.7	17.1	20.1	23.1	26.7	29.1			
		MCWB	16.2	16.4	15.1	13.6	11.2	9.0	8.7	9.0	10.2	11.8	13.8	15.3			
	5%	DB	28.2	28.1	25.2	21.4	17.9	14.2	14.0	15.2	18.1	21.1	24.5	27.0			
		MCWB	15.0	15.8	14.1	12.3	10.7	8.1	7.8	8.0	9.1	10.7	12.9	14.4			
	10%	DB	26.2	25.9	23.2	19.8	16.1	12.9	12.5	13.9	16.4	19.2	22.6	25.1			
		MCWB	14.1	14.6	13.3	11.4	9.6	7.3	6.9	7.4	8.2	9.9	11.9	13.4			
Monthly Design Wet Bulb and Mean Coincident Dry Bulb Temperatures	0.4%	WB	19.3	19.6	17.7	15.8	13.6	10.8	10.7	11.4	12.5	14.6	16.4	18.1			
		MCDB	29.4	30.2	27.1	23.7	19.7	16.4	16.2	17.9	21.1	23.0	25.9	29.1			
	2%	WB	17.7	17.9	16.2	14.4	12.3	9.6	9.4	9.9	10.9	12.8	14.8	16.4			
		MCDB	26.4	27.1	23.9	21.4	17.9	14.5	14.5	15.8	18.2	20.8	24.4	26.4			
	5%	WB	16.4	16.7	15.3	13.2	11.2	8.7	8.3	8.9	10.0	11.7	13.6	15.2			
		MCDB	25.0	25.2	22.6	19.4	16.5	13.4	12.9	14.3	16.6	19.2	22.7	24.8			
	10%	WB	15.3	15.6	14.3	12.2	10.2	7.7	7.3	7.9	9.0	10.7	12.5	14.3			
		MCDB	24.2	23.4	21.5	18.2	14.8	11.9	11.7	12.5	15.0	17.8	20.9	23.4			

Mean Daily Temperature Range		MDBR	11.2	10.8	10.3	9.3	7.9	7.0	7.3	8.1	9.1	10.2	11.0	11.2
	5% DB	MCDBR	14.3	14.8	13.5	11.7	9.7	7.9	8.5	9.6	11.5	12.6	13.9	14.1
		MCWBR	5.9	6.1	6.1	6.0	5.6	4.9	5.0	5.3	5.8	5.9	6.4	6.1
	5% WB	MCDBR	13.0	13.1	12.0	10.7	9.0	7.6	8.1	9.0	10.7	11.8	13.2	13.2
		MCWBR	6.3	6.1	6.2	6.4	5.8	5.2	5.2	5.5	5.8	5.9	6.4	6.1
Clear Sky Solar Irradiance	taub		0.334	0.339	0.317	0.309	0.293	0.282	0.282	0.297	0.314	0.318	0.322	0.335
	taud		2.537	2.525	2.583	2.595	2.594	2.579	2.592	2.579	2.527	2.528	2.536	2.512
	Ebn at noon		986	950	925	855	788	756	794	854	912	963	993	992
	Edn at noon		105	101	85	71	58	52	56	70	88	99	105	110
All-Sky Solar Radiation	RadAvg		7.50	6.24	4.54	2.96	1.73	1.29	1.50	2.35	3.78	5.51	6.95	7.66
	RadStd		0.25	0.34	0.21	0.15	0.11	0.08	0.09	0.19	0.22	0.24	0.21	0.38
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		+0.35	N/A	+2.49	+0.48	+0.92	+1.13	N/A	-105	+72	+24			
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