

2021 ASHRAE Handbook - Fundamentals (SI)																		
MARCOS JUAREZ, ARGENTINA (WMO: 874670)																		
Lat:32.6797S			Long:62.1506W			Elev:114			StdP: 99.96			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	0.4	-5.6	2.4	4.2	-4.1	2.7	5.1	15.0	11.0	12.8	11.1	1.2	50	0.436			
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	12.0	34.4	24.0	33.1	23.3	31.8	22.8	26.2	31.7	25.2	30.6	24.3	29.3	4.4	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				
24.7	20.0	29.8	23.7	18.8	28.4	22.8	17.7	27.3	82.7	31.9	78.2	30.7	74.2	29.5	29.8			
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			
13.1	10.5	9.0	DB	-4.5	37.2	1.6	1.3	-5.6	38.2	-6.5	39.0	-7.4	39.7	-8.5	40.7			
			WB	-5.1	28.2	1.5	0.9	-6.2	28.8	-7.0	29.4	-7.9	29.9	-8.9	30.5			
Monthly Climatic Design Conditions																		
			Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
Temperatures, Degree-Days and Degree-Hours	DBAvg	17.5	23.7	22.6	21.1	18.0	14.4	11.2	10.3	12.5	14.7	18.0	21.0	23.1				
	DBStd	5.84	2.74	3.11	3.32	3.73	3.84	3.70	3.90	4.46	3.95	3.54	3.21	2.96				
	HDD10.0	103	0	0	0	1	6	27	42	23	6	0	0	0				
	HDD18.3	1041	1	3	12	51	134	217	251	191	120	48	12	2				
	CDD10.0	2851	426	353	344	239	142	62	52	99	148	248	331	407				
	CDD18.3	748	168	123	98	39	12	3	2	9	12	38	92	151				
	CDH23.3	7305	1644	1078	872	337	77	11	18	113	174	446	986	1549				
	CDH26.7	2837	693	423	317	92	13	1	4	39	46	147	388	674				
Wind		WSAvg	3.4	2.9	2.7	2.8	3.1	2.9	3.2	3.5	4.0	4.3	4.3	3.9	3.6			
Precipitation	PrecAvg	884	116	101	117	80	37	30	23	22	51	96	102	139				
	PrecMax	1312	350	373	269	254	112	184	116	94	194	299	218	368				
	PrecMin	597	9	28	15	1	0	0	0	0	1	12	18	38				
	PrecStd	191	67	66	67	56	32	40	26	23	47	58	53	77				
Monthly Design Dry Bulb and Mean Coincident Wet Bulb Temperatures	0.4%	DB	35.7	35.0	34.0	31.7	28.4	24.9	26.0	31.3	31.1	33.6	34.9	36.1				
		MCWB	25.6	25.8	24.0	23.2	21.1	19.8	18.9	20.0	20.6	22.2	22.6	24.6				
	2%	DB	33.7	32.9	31.9	29.3	25.4	21.1	21.9	26.2	27.8	30.5	32.8	34.1				
		MCWB	24.7	24.6	23.1	21.4	19.4	16.6	16.1	18.1	18.4	20.3	21.2	23.5				
	5%	DB	32.2	31.2	30.1	27.1	23.0	19.0	19.4	22.7	25.2	27.9	31.0	32.4				
		MCWB	24.0	24.1	22.4	19.8	18.1	15.3	14.5	16.0	16.7	18.9	20.2	22.6				
	10%	DB	30.6	29.4	28.3	25.0	20.8	17.3	17.3	20.2	22.9	25.6	28.9	30.6				
		MCWB	23.3	23.0	21.3	19.1	16.9	13.9	12.8	14.1	15.5	17.8	19.6	21.9				
Monthly Design Wet Bulb and Mean Coincident Dry Bulb Temperatures	0.4%	WB	27.5	27.5	26.4	24.7	22.4	20.2	19.6	21.3	21.9	24.0	24.6	27.2				
		MCDB	33.0	33.1	32.0	29.7	26.2	23.6	24.4	28.7	29.0	31.2	31.9	33.2				
	2%	WB	26.1	26.0	24.6	22.8	20.6	18.2	17.6	19.2	19.9	21.8	22.8	25.3				
		MCDB	31.7	31.1	29.4	26.9	23.9	20.1	21.2	24.9	25.2	28.0	29.6	31.1				
	5%	WB	25.1	24.8	23.3	21.4	19.1	16.6	15.7	17.2	18.2	20.3	21.6	24.1				
		MCDB	30.4	29.5	28.3	25.1	22.0	18.1	18.0	21.3	23.2	25.5	27.9	29.8				
	10%	WB	24.1	23.7	22.2	20.1	17.5	14.9	14.1	15.3	16.6	19.0	20.6	22.9				
		MCDB	28.9	28.1	26.7	23.7	20.3	16.4	16.1	18.8	21.2	24.2	26.8	28.6				

Mean Daily Temperature Range		MDBR	12.0	11.3	12.0	11.4	10.7	11.0	12.0	13.3	13.6	12.6	13.0	12.6
	5% DB	MCDBR	14.4	14.0	14.3	14.5	12.9	12.7	15.0	16.5	17.3	16.3	16.6	15.6
		MCWBR	6.9	6.7	6.6	7.2	7.1	8.0	9.0	9.0	8.9	7.5	7.0	6.8
	5% WB	MCDBR	12.5	11.8	12.0	11.5	10.6	8.9	11.6	14.4	14.2	13.5	14.0	12.9
		MCWBR	6.9	6.4	6.2	6.3	6.4	6.6	7.7	8.4	8.9	7.5	7.0	6.8
Clear Sky Solar Irradiance	taub		0.408	0.390	0.376	0.373	0.350	0.333	0.342	0.393	0.452	0.416	0.396	0.397
	taud		2.320	2.386	2.426	2.404	2.420	2.464	2.407	2.231	2.063	2.234	2.321	2.340
	Ebn at noon		931	927	905	848	815	808	815	811	813	892	936	945
	Edn at noon		137	124	111	102	89	80	89	119	157	143	136	135
All-Sky Solar Radiation	RadAvg		7.21	6.21	5.26	3.81	2.80	2.47	2.71	3.64	4.80	5.73	6.89	7.33
	RadStd		0.41	0.48	0.43	0.47	0.27	0.32	0.26	0.34	0.42	0.46	0.42	0.47
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	+0.50	+0.73	N/A	N/A	N/A	N/A			
Regional (0 neighbors)		N/A	N/A	N/A	+0.23	+0.49	+0.55	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