

2021 ASHRAE Handbook - Fundamentals (SI)

AZUL, ARGENTINA (WMO: 876410)																
Lat: 36.8322S			Long: 59.8864W			Elev: 147		StdP: 99.57		Time zone: -3.00 (W03)			Period: 99-19		WBAN: 99999	
Annual Heating, Humidification, and Ventilation Design Conditions																
Coldest Month	Heating DB		Humidification DP/MCDB and HR						Coldest month WS/MCDB				MCWS/PCWD		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	-3.0	-1.4	-5.9	2.3	4.0	-4.6	2.6	3.3	13.5	8.9	12.1	9.4	0.7	270	0.514	
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	32.8	20.5	31.2	20.2	29.7	19.8	23.1	28.8	22.1	27.8	21.3	26.8	5.4	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		
21.4	16.4	25.5	20.4	15.4	24.5	19.6	14.6	23.7	69.5	28.9	65.6	27.7	62.6	27.0	27.6	
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	
12.2	10.5	9.8	DB	-5.9	36.1	1.5	1.5	-7.0	37.2	-7.9	38.0	-8.7	38.8	-9.8	39.9	
			WB	-5.9	25.1	1.4	1.2	-6.9	25.9	-7.8	26.6	-8.6	27.2	-9.6	28.1	
Monthly Climatic Design Conditions																
			Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Temperatures, Degree-Days and Degree-Hours	DBAvg	14.3	21.7	20.7	18.0	14.4	11.0	8.1	7.3	9.2	11.0	13.8	17.1	20.2		
	DBStd	5.96	3.26	3.34	3.51	3.62	3.47	2.96	3.32	3.63	3.32	3.27	3.50	3.56		
	HDD10.0	297	0	0	0	6	29	73	96	59	27	7	1	0		
	HDD18.3	1814	9	15	51	126	228	308	341	284	221	146	64	22		
	CDD10.0	1878	362	300	247	137	60	14	13	33	57	124	213	317		
	CDD18.3	353	113	82	39	7	1	0	0	1	1	4	26	81		
	CDH23.3	3719	1224	760	318	54	3	0	0	8	9	54	335	953		
	CDH26.7	1282	481	265	74	4	0	0	0	2	1	8	82	364		
Wind		WSAvg	3.6	4.0	3.3	3.2	2.9	2.9	3.2	3.2	3.7	4.2	4.2	4.3	4.1	
Precipitation	PrecAvg	936	107	109	116	82	58	37	44	56	59	86	89	88		
	PrecMax	1381	238	421	297	214	137	97	107	292	135	184	197	218		
	PrecMin	620	54	18	26	4	7	6	0	0	3	20	15	24		
	PrecStd	232	56	92	67	56	39	27	28	67	40	41	51	51		
Monthly Design Dry Bulb and Mean Coincident Wet Bulb Temperatures	0.4%	DB	35.5	33.8	31.4	27.1	23.4	18.9	19.0	23.7	24.3	27.8	31.1	34.7		
		MCWB	21.0	20.8	20.9	18.6	17.4	14.9	14.7	16.6	16.4	18.2	19.9	20.3		
	2%	DB	33.0	31.6	28.7	25.0	20.7	16.8	16.4	20.0	21.5	24.7	28.9	32.3		
		MCWB	20.6	21.5	19.9	18.0	15.9	13.0	12.6	14.3	14.3	16.8	18.4	19.8		
	5%	DB	31.2	29.9	26.6	23.2	18.6	15.1	14.8	17.3	19.8	22.7	27.1	30.6		
		MCWB	20.0	20.6	19.2	17.0	14.4	11.7	11.6	12.2	13.1	15.6	17.9	19.4		
	10%	DB	29.5	28.1	24.9	21.5	16.9	13.6	13.1	15.5	17.8	20.9	25.1	28.5		
		MCWB	19.7	20.3	18.5	16.4	13.8	10.6	10.3	11.4	12.2	14.8	16.8	18.9		
Monthly Design Wet Bulb and Mean Coincident Dry Bulb Temperatures	0.4%	WB	24.6	24.7	23.2	22.0	19.1	17.2	16.2	18.4	18.9	19.6	21.4	23.5		
		MCDB	30.5	29.8	27.7	25.8	22.0	18.2	18.2	22.6	21.9	24.6	28.2	30.2		
	2%	WB	22.8	23.2	21.7	20.1	17.3	14.7	14.2	15.7	16.0	17.9	19.9	22.1		
		MCDB	29.2	28.0	26.2	22.3	19.4	15.6	15.5	17.8	19.8	22.5	26.4	28.4		
	5%	WB	21.7	22.0	20.5	18.6	15.8	12.5	12.3	13.8	14.4	16.8	18.8	21.0		
		MCDB	28.1	27.2	24.8	21.5	17.6	13.9	13.7	16.0	17.8	21.1	24.9	27.6		
	10%	WB	21.0	21.1	19.5	17.2	14.4	11.0	10.8	12.2	13.2	15.8	17.8	19.9		
		MCDB	27.0	25.9	23.4	20.6	16.2	13.1	12.5	14.9	16.4	19.7	23.2	26.2		

Mean Daily Temperature Range		MDBR	13.9	12.6	12.1	11.9	10.5	10.4	9.9	10.7	11.3	11.6	13.3	13.9
	5% DB	MCDBR	16.0	14.8	13.9	14.2	12.4	11.8	11.7	13.2	14.5	14.7	15.8	16.4
		MCWBR	6.2	5.9	6.4	7.7	7.3	7.8	7.7	8.0	8.1	7.9	7.1	6.4
	5% WB	MCDBR	13.2	12.2	11.4	10.6	9.2	8.7	8.7	10.3	11.3	12.2	13.6	14.0
		MCWBR	6.5	6.1	5.9	6.7	6.1	7.1	6.9	7.2	8.1	7.9	7.1	6.4
Clear Sky Solar Irradiance	taub		0.403	0.388	0.373	0.362	0.353	0.335	0.338	0.390	0.431	0.404	0.390	0.392
	taud		2.315	2.365	2.400	2.382	2.372	2.432	2.397	2.222	2.100	2.239	2.307	2.319
	Ebn at noon		931	921	895	839	781	771	790	791	818	895	938	946
	Edn at noon		136	124	111	99	87	77	84	114	147	139	136	137
All-Sky Solar Radiation	RadAvg		7.40	6.42	5.13	3.71	2.52	2.10	2.21	3.07	4.22	5.48	6.87	7.78
	RadStd		0.36	0.46	0.35	0.37	0.20	0.21	0.23	0.33	0.30	0.54	0.38	0.34

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	+0.75	N/A	N/A	N/A	N/A	N/A	N/A	+37			

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	