

2021 ASHRAE Handbook - Fundamentals (SI)

| BUENOS AIRES SAN FERNANDO, ARGENTINA (WMO: 875530) | | | | | | | | | | | | | | | | |
|---|------------------------|-----------------|-------------------------------|----------------------------|------|--------------------|------|--|-----------------------|-------------------------------|------|------------|----------------------|------------|--------------------|--|
| Lat: 34.455S | | | Long: 58.5844W | | | Elev: 10 | | StdP: 101.20 | | Time zone: -3.00 (W03) | | | Period: 02-19 | | 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 | 1.8 | 3.0 | -2.9 | 3.0 | 6.7 | -1.2 | 3.4 | 7.5 | 9.1 | 11.4 | 8.3 | 11.2 | 1.1 | 230 | 0.406 | |
| 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 | 9.4 | 33.1 | 23.2 | 31.9 | 23.0 | 30.5 | 22.5 | 25.3 | 30.3 | 24.5 | 29.4 | 23.8 | 28.4 | 4.5 | 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 | | |
| 23.9 | 18.8 | 28.2 | 23.0 | 17.8 | 27.2 | 22.2 | 16.9 | 26.4 | 77.4 | 31.0 | 74.0 | 29.1 | 71.0 | 28.7 | 29.0 | |
| 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 | Min | Max | |
| 8.5 | 7.5 | 6.8 | DB | -1.1 | 36.2 | 1.0 | 1.3 | -1.8 | 37.1 | -2.4 | 37.9 | -3.0 | 38.6 | -3.7 | 39.6 | |
| | | | WB | -1.9 | 27.1 | 0.7 | 0.9 | -2.4 | 27.7 | -2.8 | 28.2 | -3.2 | 28.7 | -3.7 | 29.3 | |
| Monthly Climatic Design Conditions | | | | | | | | | | | | | | | | |
| | | | Annual | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | |
| Temperatures, Degree-Days and Degree-Hours | DBAvg | 17.7 | 24.6 | 23.5 | 21.2 | 18.1 | 14.7 | 11.4 | 10.8 | 12.6 | 14.5 | 17.3 | 20.7 | 22.9 | | |
| | DBStd | 5.67 | 2.63 | 2.80 | 3.13 | 3.46 | 3.13 | 3.28 | 3.46 | 3.96 | 3.24 | 3.13 | 2.92 | 3.19 | | |
| | HDD10.0 | 72 | 0 | 0 | 0 | 1 | 2 | 20 | 31 | 16 | 3 | 0 | 0 | 0 | | |
| | HDD18.3 | 993 | 1 | 1 | 11 | 44 | 118 | 208 | 234 | 184 | 121 | 57 | 11 | 3 | | |
| | CDD10.0 | 2873 | 453 | 378 | 346 | 243 | 148 | 63 | 56 | 97 | 138 | 228 | 321 | 401 | | |
| | CDD18.3 | 753 | 195 | 146 | 99 | 37 | 7 | 2 | 2 | 7 | 6 | 26 | 82 | 146 | | |
| | CDH23.3 | 5925 | 1797 | 1138 | 647 | 163 | 17 | 3 | 6 | 58 | 47 | 153 | 591 | 1305 | | |
| | CDH26.7 | 1876 | 645 | 359 | 144 | 31 | 0 | 0 | 0 | 16 | 9 | 31 | 166 | 476 | | |
| Wind | | WSAvg | 3.2 | 3.5 | 3.3 | 3.0 | 2.6 | 2.5 | 2.6 | 2.8 | 3.1 | 3.6 | 3.6 | 3.7 | 3.5 | |
| Precipitation | PrecAvg | 1129 | 119 | 127 | 113 | 109 | 76 | 56 | 62 | 63 | 67 | 118 | 116 | 105 | | |
| | PrecMax | 1779 | 244 | 298 | 336 | 197 | 296 | 119 | 158 | 218 | 179 | 272 | 239 | 266 | | |
| | PrecMin | 681 | 34 | 36 | 23 | 15 | 3 | 5 | 9 | 3 | 18 | 30 | 17 | 26 | | |
| | PrecStd | 238 | 57 | 75 | 70 | 55 | 60 | 35 | 36 | 57 | 42 | 64 | 58 | 63 | | |
| Monthly Design Dry Bulb and Mean Coincident Wet Bulb Temperatures | 0.4% | DB | 35.2 | 33.8 | 31.8 | 30.1 | 25.2 | 23.1 | 23.9 | 29.0 | 27.2 | 30.0 | 32.8 | 35.2 | | |
| | | MCWB | 24.6 | 24.4 | 23.0 | 22.8 | 19.6 | 19.0 | 18.6 | 21.0 | 19.7 | 21.1 | 22.4 | 22.7 | | |
| | 2% | DB | 33.1 | 32.0 | 29.9 | 26.9 | 23.0 | 20.1 | 20.1 | 24.2 | 24.2 | 27.0 | 30.2 | 33.0 | | |
| | | MCWB | 23.6 | 24.0 | 22.5 | 20.3 | 18.1 | 16.3 | 15.7 | 18.5 | 17.1 | 19.6 | 21.6 | 22.4 | | |
| | 5% | DB | 31.8 | 30.7 | 28.1 | 25.0 | 21.1 | 18.8 | 17.9 | 21.1 | 22.0 | 25.0 | 28.8 | 31.1 | | |
| | | MCWB | 23.2 | 23.3 | 21.3 | 19.9 | 17.5 | 15.6 | 14.6 | 16.3 | 15.9 | 18.3 | 20.5 | 21.8 | | |
| | 10% | DB | 30.1 | 29.0 | 26.8 | 23.2 | 19.9 | 17.0 | 16.1 | 18.9 | 20.1 | 23.0 | 26.9 | 29.2 | | |
| | | MCWB | 22.6 | 22.7 | 21.6 | 19.0 | 16.8 | 14.0 | 13.2 | 14.9 | 14.7 | 17.4 | 19.8 | 21.3 | | |
| Monthly Design Wet Bulb and Mean Coincident Dry Bulb Temperatures | 0.4% | WB | 26.7 | 26.4 | 25.2 | 23.5 | 20.7 | 19.6 | 18.3 | 21.4 | 21.0 | 23.4 | 24.0 | 25.7 | | |
| | | MCDB | 32.2 | 31.0 | 28.9 | 28.8 | 23.5 | 21.5 | 21.6 | 27.6 | 25.4 | 28.8 | 29.7 | 30.6 | | |
| | 2% | WB | 25.4 | 25.1 | 24.0 | 22.1 | 19.3 | 17.8 | 16.9 | 19.4 | 18.6 | 21.1 | 22.8 | 24.5 | | |
| | | MCDB | 30.9 | 29.8 | 27.5 | 25.1 | 21.6 | 19.8 | 19.4 | 24.0 | 22.4 | 25.2 | 28.0 | 29.9 | | |
| | 5% | WB | 24.4 | 24.2 | 23.0 | 21.1 | 18.3 | 16.2 | 15.3 | 17.5 | 17.3 | 19.6 | 21.7 | 23.6 | | |
| | | MCDB | 29.6 | 28.7 | 26.4 | 23.7 | 20.5 | 17.8 | 17.3 | 20.1 | 20.4 | 23.0 | 26.9 | 28.7 | | |
| | 10% | WB | 23.6 | 23.5 | 22.1 | 20.1 | 17.3 | 14.6 | 14.0 | 15.7 | 16.1 | 18.5 | 20.7 | 22.6 | | |
| | | MCDB | 28.4 | 27.5 | 25.6 | 22.7 | 19.4 | 16.6 | 15.9 | 18.0 | 19.2 | 22.0 | 25.2 | 27.3 | | |

| | | | | | |
|----------|--|-------|---|-----------------------|---|
| 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 |