

**Design conditions for KANSAS CITY, MO, USA**

**Station Information**

| Station name       | WMO#          | Lat           | Long          | Elev       | StdP         | Hours +/- UTC | Time zone code | Period      |
|--------------------|---------------|---------------|---------------|------------|--------------|---------------|----------------|-------------|
| 1a                 | 1b            | 1c            | 1d            | 1e         | 1f           | 1g            | 1h             | 1i          |
| <b>KANSAS CITY</b> | <b>724460</b> | <b>39.28N</b> | <b>94.72W</b> | <b>315</b> | <b>97.60</b> | <b>-6.00</b>  | <b>NAC</b>     | <b>7201</b> |

**Annual Heating and Humidification Design Conditions**

| Coldest month | Heating DB   |              | Humidification DP/MCDB and HR |            |              |              |            |              | Coldest month WS/MCDB |            |             |            | MCWS/PCWD to 99.6% DB |            |
|---------------|--------------|--------------|-------------------------------|------------|--------------|--------------|------------|--------------|-----------------------|------------|-------------|------------|-----------------------|------------|
|               | 99.6%        | 99%          | 99.6%                         |            |              | 99%          |            |              | 0.4%                  |            | 1%          |            | MCWS                  | PCWD       |
|               |              |              | DP                            | HR         | MCDB         | DP           | HR         | MCDB         | WS                    | MCDB       | WS          | MCDB       |                       |            |
| 2             | 3a           | 3b           | 4a                            | 4b         | 4c           | 4d           | 4e         | 4f           | 5a                    | 5b         | 5c          | 5d         | 6a                    | 6b         |
| <b>1</b>      | <b>-18.9</b> | <b>-15.8</b> | <b>-24.7</b>                  | <b>0.4</b> | <b>-18.1</b> | <b>-21.0</b> | <b>0.6</b> | <b>-14.9</b> | <b>12.9</b>           | <b>1.8</b> | <b>11.9</b> | <b>1.7</b> | <b>4.3</b>            | <b>300</b> |

**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%          |             | MCWS                 | PCWD       |
|               |                        | DB              | MCWB        | DB          | MCWB        | DB          | MCWB        | WB                  | MCDB        | WB          | MCDB        | WB          | MCDB        |                      |            |
| 7             | 8                      | 9a              | 9b          | 9c          | 9d          | 9e          | 9f          | 10a                 | 10b         | 10c         | 10d         | 10e         | 10f         | 11a                  | 11b        |
| <b>7</b>      | <b>10.6</b>            | <b>35.4</b>     | <b>24.2</b> | <b>33.7</b> | <b>24.1</b> | <b>32.1</b> | <b>23.7</b> | <b>26.2</b>         | <b>32.0</b> | <b>25.4</b> | <b>31.4</b> | <b>24.7</b> | <b>30.4</b> | <b>5.6</b>           | <b>190</b> |

  

| Dehumidification DP/MCDB and HR |             |             |             |             |             |             |             |             | Enthalpy/MCDB |             |             |             |             |             |      |
|---------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------|-------------|-------------|-------------|-------------|-------------|------|
| DP                              | 0.4%        |             | 1%          |             |             | 2%          |             |             | Enth          | 0.4%        |             | 1%          |             | 2%          |      |
|                                 | HR          | MCDB        | DP          | HR          | MCDB        | DP          | HR          | MCDB        |               | MCDB        | MCDB        | Enth        | MCDB        | Enth        | MCDB |
| 12a                             | 12b         | 12c         | 12d         | 12e         | 12f         | 12g         | 12h         | 12i         | 13a           | 13b         | 13c         | 13d         | 13e         | 13f         |      |
| <b>24.5</b>                     | <b>20.3</b> | <b>29.9</b> | <b>23.6</b> | <b>19.2</b> | <b>29.0</b> | <b>22.9</b> | <b>18.3</b> | <b>28.1</b> | <b>83.1</b>   | <b>31.9</b> | <b>79.5</b> | <b>31.3</b> | <b>76.3</b> | <b>30.6</b> |      |

**Extreme Annual Design Conditions**

| Extreme Annual WS |             |            | Extreme Max WB | Extreme Annual DB |              |                    |            | n-Year Return Period Values of Extreme DB |              |             |              |             |              |             |              |
|-------------------|-------------|------------|----------------|-------------------|--------------|--------------------|------------|---|--------------|-------------|--------------|-------------|--------------|-------------|--------------|
| 1%                | 2.5%        | 5%         |                | Mean              |              | Standard deviation |            | n=5 years                                 |              | n=10 years  |              | n=20 years  |              | n=50 years  |              |
| 14a               | 14b         | 14c        |                | Max               | Min          | Max                | Min        | Max                                       | Min          | Max         | Min          | Max         | Min          | Max         | Min          |
| <b>11.5</b>       | <b>10.4</b> | <b>9.0</b> | <b>29.1</b>    | <b>37.9</b>       | <b>-22.2</b> | <b>2.3</b>         | <b>3.7</b> | <b>39.6</b>                               | <b>-24.9</b> | <b>40.9</b> | <b>-27.0</b> | <b>42.2</b> | <b>-29.1</b> | <b>43.9</b> | <b>-31.8</b> |

**Monthly Design Dry Bulb and Mean Coincident Wet Bulb Temperatures**

| %    | Jan         |             | Feb         |             | Mar         |             | Apr         |             | May         |             | Jun         |             |
|------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|      | DB          | MCWB        | DB          | MCWB        | DB          | MCWB        | DB          | MCWB        | DB          | MCWB        | DB          | MCWB        |
|      | 18a         | 18b         | 18c         | 18d         | 18e         | 18f         | 18g         | 18h         | 18i         | 18j         | 18k         | 18l         |
| 0.4% | <b>16.1</b> | <b>11.9</b> | <b>20.3</b> | <b>12.3</b> | <b>25.3</b> | <b>15.2</b> | <b>29.8</b> | <b>18.7</b> | <b>31.1</b> | <b>22.1</b> | <b>35.4</b> | <b>23.7</b> |
| 1%   | <b>14.2</b> | <b>9.3</b>  | <b>18.4</b> | <b>11.8</b> | <b>23.6</b> | <b>14.9</b> | <b>28.1</b> | <b>18.4</b> | <b>30.0</b> | <b>21.5</b> | <b>33.9</b> | <b>23.8</b> |
| 2%   | <b>12.4</b> | <b>8.1</b>  | <b>16.7</b> | <b>10.4</b> | <b>22.0</b> | <b>14.4</b> | <b>26.5</b> | <b>17.7</b> | <b>29.0</b> | <b>20.9</b> | <b>32.9</b> | <b>23.7</b> |

  

| %    | Jul         |             | Aug         |             | Sep         |             | Oct         |             | Nov         |             | Dec         |             |
|------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|      | DB          | MCWB        | DB          | MCWB        | DB          | MCWB        | DB          | MCWB        | DB          | MCWB        | DB          | MCWB        |
|      | 18m         | 18n         | 18o         | 18p         | 18q         | 18r         | 18s         | 18t         | 18u         | 18v         | 18w         | 18x         |
| 0.4% | <b>38.3</b> | <b>24.2</b> | <b>37.8</b> | <b>24.3</b> | <b>34.8</b> | <b>23.3</b> | <b>29.5</b> | <b>19.7</b> | <b>23.2</b> | <b>16.0</b> | <b>18.0</b> | <b>13.7</b> |
| 1%   | <b>36.9</b> | <b>24.4</b> | <b>36.4</b> | <b>24.0</b> | <b>33.3</b> | <b>23.2</b> | <b>27.9</b> | <b>18.5</b> | <b>21.3</b> | <b>15.4</b> | <b>16.4</b> | <b>12.8</b> |
| 2%   | <b>35.8</b> | <b>24.6</b> | <b>35.2</b> | <b>24.1</b> | <b>32.1</b> | <b>22.8</b> | <b>26.4</b> | <b>18.0</b> | <b>20.0</b> | <b>14.8</b> | <b>14.8</b> | <b>11.0</b> |

**Monthly Design Wet Bulb and Mean Coincident Dry Bulb Temperatures**

| %    | Jan         |             | Feb         |             | Mar         |             | Apr         |             | May         |             | Jun         |             |
|------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|      | WB          | MCDB        | WB          | MCDB        | WB          | MCDB        | WB          | MCDB        | WB          | MCDB        | WB          | MCDB        |
|      | 19a         | 19b         | 19c         | 19d         | 19e         | 19f         | 19g         | 19h         | 19i         | 19j         | 19k         | 19l         |
| 0.4% | <b>12.7</b> | <b>15.2</b> | <b>14.5</b> | <b>19.0</b> | <b>17.7</b> | <b>22.3</b> | <b>20.8</b> | <b>27.3</b> | <b>24.2</b> | <b>29.3</b> | <b>26.1</b> | <b>31.9</b> |
| 1%   | <b>10.6</b> | <b>13.0</b> | <b>12.7</b> | <b>16.6</b> | <b>16.8</b> | <b>21.5</b> | <b>20.1</b> | <b>25.8</b> | <b>23.3</b> | <b>28.0</b> | <b>25.5</b> | <b>31.3</b> |
| 2%   | <b>8.5</b>  | <b>11.5</b> | <b>11.1</b> | <b>15.1</b> | <b>15.8</b> | <b>20.4</b> | <b>19.2</b> | <b>24.4</b> | <b>22.4</b> | <b>27.1</b> | <b>25.1</b> | <b>30.8</b> |

  

| %    | Jul         |             | Aug         |             | Sep         |             | Oct         |             | Nov         |             | Dec         |             |
|------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|      | WB          | MCDB        | WB          | MCDB        | WB          | MCDB        | WB          | MCDB        | WB          | MCDB        | WB          | MCDB        |
|      | 19m         | 19n         | 19o         | 19p         | 19q         | 19r         | 19s         | 19t         | 19u         | 19v         | 19w         | 19x         |
| 0.4% | <b>27.5</b> | <b>33.0</b> | <b>27.1</b> | <b>32.3</b> | <b>25.2</b> | <b>31.8</b> | <b>20.9</b> | <b>26.2</b> | <b>17.6</b> | <b>20.9</b> | <b>15.1</b> | <b>17.1</b> |
| 1%   | <b>26.9</b> | <b>32.5</b> | <b>26.6</b> | <b>32.1</b> | <b>24.7</b> | <b>30.9</b> | <b>20.2</b> | <b>25.0</b> | <b>16.8</b> | <b>20.0</b> | <b>13.6</b> | <b>15.8</b> |
| 2%   | <b>26.4</b> | <b>32.2</b> | <b>26.0</b> | <b>31.7</b> | <b>24.1</b> | <b>29.9</b> | <b>19.6</b> | <b>24.0</b> | <b>15.8</b> | <b>18.8</b> | <b>11.7</b> | <b>13.9</b> |

**Monthly Mean Daily Temperature Range**

| Jan        | Feb        | Mar         | Apr         | May         | Jun         | Jul         | Aug         | Sep         | Oct         | Nov        | Dec        |
|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|------------|
| 20a        | 20b        | 20c         | 20d         | 20e         | 20f         | 20g         | 20h         | 20i         | 20j         | 20k        | 20l        |
| <b>9.3</b> | <b>9.9</b> | <b>10.9</b> | <b>11.1</b> | <b>10.6</b> | <b>10.6</b> | <b>10.6</b> | <b>10.8</b> | <b>11.2</b> | <b>11.3</b> | <b>9.7</b> | <b>9.1</b> |

WMO# World Meteorological Organization number Lat Latitude, ° Long Longitude, °  
 Elev Elevation, m StdP Standard pressure at station elevation, kPa  
 DB Dry bulb temperature, °C DP Dew point temperature, °C WB Wet bulb temperature, °C  
 WS Wind speed, m/s Enth Enthalpy, kJ/kg HR Humidity ratio, grams of moisture per kilogram of dry air  
 MCDB Mean coincident dry bulb temperature, °C MCWB Mean coincident wet bulb temperature, °C MCWS Mean coincident wind speed, m/s  
 PCWD Prevailing coincident wind direction, °, 0 = North, 90 = East