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# HANNOVER, Germany

WMO#: **103380**

Lat: **52.47N** Long: **9.70E** Elev: **55** StdP: **100.67** Time Zone: **1.00 (EUW)** Period: **82-03** WBAN: **99999**

## 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% | | | 0.4% | | 1% | | | | |
| | | 99.6% | 99% | DP | HR | MCDB | DP | HR | MCDB | WS | MCDB | WS | MCDB | MCWS | PCWD | |
| | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) | (o) | |
| (1) | **2** | **-12.7** | **-9.7** | **-14.9** | **1.0** | **-11.3** | **-12.0** | **1.4** | **-9.1** | **12.3** | **6.3** | **11.1** | **6.1** | **2.5** | **80** | (1) |

## 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 | |
| | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) | (o) | (p) | |
| (2) | **7** | **10.0** | **28.9** | **19.4** | **27.0** | **18.5** | **25.1** | **17.6** | **20.4** | **26.5** | **19.4** | **25.2** | **18.5** | **23.6** | **4.1** | **110** | (2) |

| Dehumidification DP/MCDB and HR | | | | | | | | | Enthalpy/MCDB | | | | | | Hours 8 to 4 & 12.8/20.6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.4% | | | 1% | | | 2% | | | 0.4% | | 1% | | 2% | | | |
| DP | HR | MCDB | DP | HR | MCDB | DP | HR | MCDB | Enth | MCDB | Enth | MCDB | Enth | MCDB | | |
| (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) | (o) | (p) | |
| **18.3** | **13.3** | **22.2** | **17.3** | **12.5** | **21.6** | **16.4** | **11.7** | **20.8** | **58.6** | **26.3** | **55.5** | **25.3** | **52.4** | **23.5** | **1000** | (3) |

## Extreme Annual Design Conditions

| Extreme Annual WS | | | Extreme Max WB | Extreme Annual DB | | | | n-Year Return Period Values of Extreme DB | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 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 | |
| (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) | (o) | (p) | |
| **10.2** | **8.9** | **8.0** | **24.7** | **-13.1** | **32.5** | **5.6** | **2.2** | **-17.2** | **34.1** | **-20.4** | **35.3** | **-23.6** | **36.5** | **-27.7** | **38.1** | (4) |

## Monthly Climatic Design Conditions

| | | | | Annual (d) | Jan (e) | Feb (f) | Mar (g) | Apr (h) | May (i) | Jun (j) | Jul (k) | Aug (l) | Sep (m) | Oct (n) | Nov (o) | Dec (p) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (5) | Temperatures, Degree-Days and Degree-Hours | Tavg | | **9.3** | **1.3** | **0.9** | **4.8** | **8.0** | **12.7** | **15.6** | **17.8** | **17.7** | **14.2** | **10.1** | **5.2** | **3.0** | (5) |
| (6) | | Sd | | | **5.65** | **5.33** | **4.05** | **3.66** | **3.50** | **3.35** | **3.02** | **2.86** | **2.67** | **3.48** | **3.78** | **4.02** | (6) |
| (7) | | HDD10.0 | | **1196** | **271** | **256** | **166** | **81** | **14** | **1** | **0** | **0** | **1** | **42** | **147** | **217** | (7) |
| (8) | | HDD18.3 | | **3368** | **529** | **488** | **421** | **311** | **176** | **96** | **47** | **48** | **128** | **257** | **394** | **474** | (8) |
| (9) | | CDD10.0 | | **949** | **0** | **1** | **4** | **21** | **98** | **169** | **243** | **238** | **126** | **43** | **3** | **2** | (9) |
| (10) | | CDD18.3 | | **80** | **0** | **0** | **0** | **0** | **2** | **14** | **32** | **28** | **3** | **1** | **0** | **0** | (10) |
| (11) | | CDH23.3 | | **831** | **0** | **0** | **0** | **2** | **51** | **157** | **324** | **271** | **25** | **2** | **0** | **0** | (11) |
| (12) | | CDH26.7 | | **188** | **0** | **0** | **0** | **0** | **4** | **32** | **82** | **69** | **1** | **0** | **0** | **0** | (12) |
| (13) | Precipitation | PrecAvg | | **655** | **52** | **37** | **48** | **50** | **62** | **73** | **62** | **64** | **53** | **42** | **52** | **60** | (13) |
| (14) | | PrecMax | | **820** | **150** | **111** | **74** | **100** | **118** | **156** | **123** | **135** | **102** | **100** | **107** | **128** | (14) |
| (15) | | PrecMin | | **437** | **4** | **4** | **15** | **7** | **24** | **25** | **22** | **24** | **10** | **11** | **14** | **6** | (15) |
| (16) | | PrecSD | | **113.1** | **30.1** | **23.9** | **18.4** | **27.6** | **25.1** | **34.9** | **28.9** | **26.2** | **23.9** | **25.4** | **21.6** | **32.9** | (16) |
| (17) | Monthly Design Dry Bulb and Mean Coincident Wet Bulb Temperatures | 0.4% | DB | | **12.2** | **15.2** | **18.8** | **22.2** | **27.0** | **30.0** | **31.0** | **31.1** | **26.4** | **22.3** | **14.4** | **13.1** | (17) |
| (18) | | | MCWB | | **10.0** | **10.8** | **11.2** | **13.2** | **17.1** | **20.2** | **20.3** | **19.8** | **18.2** | **17.2** | **11.2** | **10.3** | (18) |
| (19) | | 2% | DB | | **10.1** | **12.0** | **14.6** | **19.5** | **24.7** | **27.3** | **29.1** | **28.6** | **23.4** | **18.6** | **13.0** | **11.7** | (19) |
| (20) | | | MCWB | | **8.5** | **8.9** | **9.8** | **12.3** | **15.8** | **18.6** | **19.7** | **19.1** | **17.2** | **14.5** | **10.7** | **9.5** | (20) |
| (21) | | 5% | DB | | **9.0** | **9.3** | **12.1** | **17.2** | **22.6** | **25.0** | **26.9** | **26.4** | **21.1** | **16.7** | **11.9** | **10.2** | (21) |
| (22) | | | MCWB | | **7.5** | **7.1** | **8.8** | **11.0** | **14.8** | **17.2** | **18.9** | **18.4** | **16.5** | **13.7** | **10.2** | **8.8** | (22) |
| (23) | | 10% | DB | | **7.7** | **7.4** | **10.4** | **14.7** | **20.4** | **22.7** | **24.8** | **24.2** | **19.0** | **15.1** | **10.6** | **8.9** | (23) |
| (24) | | | MCWB | | **6.3** | **5.6** | **7.8** | **10.0** | **14.0** | **16.3** | **18.0** | **17.6** | **15.0** | **12.7** | **9.2** | **7.8** | (24) |
| (25) | Monthly Design Wet Bulb and Mean Coincident Dry Bulb Temperatures | 0.4% | WB | | **10.4** | **11.3** | **11.6** | **14.6** | **18.2** | **21.9** | **21.8** | **21.1** | **19.7** | **17.5** | **12.0** | **10.8** | (25) |
| (26) | | | MCDB | | **11.6** | **14.8** | **16.2** | **21.2** | **25.6** | **27.1** | **28.4** | **29.1** | **24.1** | **21.4** | **13.3** | **12.1** | (26) |
| (27) | | 2% | WB | | **9.0** | **9.0** | **10.3** | **13.0** | **16.7** | **19.5** | **20.6** | **19.8** | **18.1** | **15.2** | **11.2** | **9.9** | (27) |
| (28) | | | MCDB | | **9.9** | **11.2** | **13.6** | **17.5** | **22.7** | **25.1** | **26.8** | **26.1** | **22.0** | **17.8** | **12.5** | **11.3** | (28) |
| (29) | | 5% | WB | | **7.6** | **7.3** | **9.2** | **11.7** | **15.6** | **18.0** | **19.6** | **18.9** | **16.8** | **14.0** | **10.4** | **9.0** | (29) |
| (30) | | | MCDB | | **8.7** | **9.1** | **11.7** | **16.2** | **21.4** | **23.5** | **25.5** | **24.6** | **20.0** | **16.0** | **11.7** | **10.3** | (30) |
| (31) | | 10% | WB | | **6.4** | **5.8** | **8.1** | **10.5** | **14.3** | **16.9** | **18.6** | **18.1** | **15.8** | **12.9** | **9.3** | **7.8** | (31) |
| (32) | | | MCDB | | **7.6** | **7.3** | **10.1** | **14.4** | **19.4** | **21.5** | **23.7** | **22.8** | **18.7** | **14.8** | **10.6** | **8.8** | (32) |
| (33) | Mean Daily Temperature Range | | MDBR | | **4.8** | **6.3** | **7.2** | **9.4** | **10.5** | **9.5** | **10.0** | **10.0** | **8.4** | **6.9** | **5.2** | **4.3** | (33) |
| (34) | | 5% DB | MCDBR | | **4.8** | **8.1** | **10.4** | **13.7** | **14.9** | **14.0** | **14.4** | **14.3** | **12.0** | **9.1** | **7.0** | **5.4** | (34) |
| (35) | | | MCWBR | | **4.3** | **5.7** | **6.5** | **7.5** | **7.5** | **6.7** | **6.6** | **6.3** | **6.8** | **5.7** | **5.2** | **4.7** | (35) |
| (36) | | 5% WB | MCDBR | | **4.5** | **7.6** | **9.4** | **11.8** | **13.2** | **12.5** | **12.7** | **12.1** | **10.6** | **8.1** | **6.2** | **5.3** | (36) |
| (37) | | | MCWBR | | **4.4** | **5.8** | **6.1** | **6.8** | **7.3** | **6.6** | **6.5** | **6.0** | **6.6** | **5.6** | **5.0** | **4.7** | (37) |
| (38) | Clear Sky Solar Irradiance | taub | | | **0.332** | **0.363** | **0.389** | **0.375** | **0.357** | **0.381** | **0.390** | **0.378** | **0.356** | **0.357** | **0.337** | **0.316** | (38) |
| (39) | | taud | | | **2.495** | **2.381** | **2.288** | **2.276** | **2.314** | **2.233** | **2.239** | **2.305** | **2.425** | **2.431** | **2.496** | **2.579** | (39) |
| (40) | | Ebn,noon | | | **671** | **740** | **792** | **857** | **892** | **870** | **854** | **844** | **823** | **738** | **654** | **638** | (40) |
| (41) | | Edh,noon | | | **55** | **80** | **105** | **119** | **120** | **132** | **129** | **114** | **90** | **74** | **54** | **44** | (41) |

Nomenclature: See separate page