

Munich climate page 1

Statistics for DEU_Munich.108660_IWEC
 Location -- MUNICH - DEU
 {N 48° 7'} {E 11° 41'} {GMT +1.0 Hours}
 Elevation -- 529m above sea level
 Standard Pressure at Elevation -- 95129Pa
 Data Source -- IWEC Data

WMO Station 108660

- Using Design Conditions from "Climate Design Data 2009 ASHRAE Handbook"

- If the design condition source is ASHRAE, the design conditions are carefully generated
- from a period of record (typically 30 years) to be representative of that location and
- be suitable for use in heating/cooling load calculations. If the source is not ASHRAE,
- please consult the referenced source for the reasoning behind the data.

Design Stat	ColdestMonth	DB996	DB990	DP996	HR_DP996	DB_DP996	DP990	HR_DP990	DB_DP990	WS004c	DB_WS004c				
WS010c	DB_WS010c	WS_DB996	WD_DB996												
Units	{}	{°C}	{°C}	{°C}	{}	{°C}	{m/s}	{°C}	{m/s}	{°C}	{deg}				
Heating	1	-14.2	-11.2	-16	1	-14	-13.2	1.3	-10.7	15.8	8.4	13.5	6.3	1.7	80

Design Stat	HottestMonth	DBR	DB004	WB_DB004	DB010	WB_DB010	DB020	WB_DB020	WB004	DB_WB004	WB010	DB_WB010							
WB020	DB_WB020	WS_DB004	WD_DB004	DP004	HR_DP004	DB_DP004	DP010	HR_DP010	DB_DP010	DP020	HR_DP020								
DB_DP020	EN004	DB_EN004	EN010	DB_EN010	EN020	DB_EN020	#Hrs_8-4_&_DB-12.8/20.6												
Units	{}	{°C}	{°C}	{°C}	{°C}	{°C}	{°C}	{°C}	{°C}	{°C}	{m/s}	{deg}	{°C}	{}	{°C}				
{°C}	{}	{°C}	{°C}	{}	{°C}	{kJ/kg}	{°C}	{kJ/kg}	{°C}	{}									
Cooling	7	10.7	29.4	18.9	27.6	18.2	25.9	17.7	19.9	26.8	19.1	25.7	18.4	24.4	3.4	90	17.8	13.6	21.8
17	12.9	21.4	16.1	12.2	20.8	59	27	56.4	25.8	54.1	24.3	936							

Design Stat	WS010	WS025	WS050	WBmax	DBmin_mean	DBmax_mean	DBmin_stddev	DBmax_stddev	DBmin05years	DBmax05years	DBmin10years					
DBmax10years	DBmin20years	DBmax20years	DBmin50years	DBmax50years												
Units	{m/s}	{m/s}	{m/s}	{°C}	{°C}	{°C}	{°C}	{°C}	{°C}	{°C}	{°C}					
Extremes	11.5	9.6	8.2	24.5	-18.2	32.2	3.8	2	-20.9	33.7	-23.1	34.9	-25.2	36	-27.9	37.5

- Monthly Statistics for Dry Bulb temperatures °C

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Maximum	10.8	10.2	19.0	22.6	25.8	27.4	33.3	31.1	27.5	24.4	14.1	9.3
Day:Hour	19:24	5:15	28:12	4:15	27:15	27:15	5:15	3:15	19:15	4:14	17:16	11:14
Minimum	-11.8	-16.5	-9.0	-3.5	0.1	4.0	9.1	5.0	4.5	-3.5	-5.4	-10.7
Day:Hour	28:06	13:07	1:06	25:05	8:04	5:04	4:03	30:01	7:05	24:06	9:07	31:19
Daily Avg	-0.5	-2.6	2.7	7.4	12.4	14.4	18.0	17.3	13.6	9.0	3.6	-0.2

- Maximum Dry Bulb temperature of 33.3°C on Jul 5
- Minimum Dry Bulb temperature of -16.5°C on Feb 13

- Average Hourly Statistics for Dry Bulb temperatures °C

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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0:01- 1:00	-1.7	-4.0	0.5	4.6	8.2	11.4	14.9	14.2	11.0	6.8	3.0	-1.0	
1:01- 2:00	-2.0	-4.3	0.2	3.8	7.7	10.7	14.3	13.9	10.8	6.7	2.7	-1.0	
2:01- 3:00	-2.0	-4.3	0.2	3.4	7.4	10.3	13.9	13.5	10.3	6.5	2.3	-1.2	
3:01- 4:00	-2.0	-4.5	0.2	3.4	6.8	9.9	13.5	13.2	10.2	6.2	2.3	-1.3	
4:01- 5:00	-1.8	-4.7	0.2	3.2	6.6	9.8	13.4	12.9	10.0	6.0	2.5	-1.5	
5:01- 6:00	-1.7	-4.7	0.2	3.0	7.2	10.5	13.9	12.9	10.2	5.8	2.4	-1.5	
6:01- 7:00	-1.6	-4.4	0.2	4.1	9.3	12.1	15.3	14.2	10.5	5.7	2.4	-1.5	
7:01- 8:00	-1.4	-4.0	1.0	5.9	11.3	13.7	17.0	15.9	11.7	6.9	2.6	-1.5	
8:01- 9:00	-1.1	-3.3	2.0	7.7	13.0	15.0	18.2	17.5	13.2	8.8	3.0	-0.9	
9:01-10:00		-0.5	-2.4	3.0	9.0	14.4	16.2	19.3	18.8	14.9	10.1	3.8	-0.1
10:01-11:00		0.1	-1.2	4.0	9.8	15.5	16.6	20.1	19.5	15.8	11.3	4.5	0.7
11:01-12:00		0.8	-0.5	5.0	10.6	16.3	17.3	20.8	20.1	16.6	12.3	5.1	1.3
12:01-13:00		1.3	-0.1	5.5	11.1	16.9	17.8	22.0	21.1	17.3	13.0	5.5	2.0
13:01-14:00		1.6	0.2	6.0	11.3	17.2	17.9	22.3	21.6	17.5	13.4	5.9	2.1
14:01-15:00		1.9	0.3	6.4	11.6	17.5	18.1	22.7	21.8	17.8	13.1	6.0	2.0
15:01-16:00		1.6	0.1	6.2	11.9	17.3	18.0	22.1	21.8	17.5	12.7	5.4	1.5
16:01-17:00		0.8	-0.5	5.9	11.5	17.1	17.8	21.9	21.5	17.0	11.9	4.4	0.7
17:01-18:00		0.4	-1.5	5.1	10.7	16.2	17.3	21.3	20.7	16.2	10.6	3.8	0.3
18:01-19:00		0.1	-2.2	4.3	9.3	15.2	16.9	20.5	19.5	15.1	9.4	3.5	0.0
19:01-20:00		-0.6	-2.8	3.0	7.6	13.4	15.4	18.9	17.7	13.7	8.7	3.3	-0.3
20:01-21:00		-0.6	-3.2	2.3	6.8	11.9	14.1	17.7	16.5	12.8	8.2	3.2	-0.5
21:01-22:00		-0.8	-3.5	1.9	6.0	10.8	13.3	16.7	15.9	12.5	7.5	2.9	-0.7
22:01-23:00		-1.1	-3.6	1.4	5.5	10.0	12.4	15.9	15.0	11.9	7.0	2.5	-0.8
23:01-24:00		-1.3	-3.7	1.1	5.1	9.2	12.1	15.4	14.6	11.4	6.9	2.5	-1.0
Max Hour		15	15	15	16	15	15	15	15	15	14	15	14
Min Hour		4	5	3	6	5	5	5	5	5	7	4	7

- Monthly Statistics for Extreme temperatures °C

#Days	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max >= 32								1				
Max <= 0	8	10	3									7
Min <= 0	25	25	17	8						4	10	28
Min <=-18												

- Monthly Statistics for Dew Point temperatures °C

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Maximum	5.2	3.8	7.7	8.2	13.3	16.6	18.9	18.2	17.2	13.5	7.5	4.8
Day:Hour	19:20	5:21	24:17	23:15	20:19	21:14	23:20	3:22	21:15	4:10	17:20	21:13
Minimum	-12.9	-17.8	-10.8	-7.2	-2.7	0.8	5.5	3.0	2.4	-5.0	-5.8	-11.1
Day:Hour	28:01	13:07	1:07	25:16	8:04	8:13	17:14	29:15	30:13	23:07	9:07	31:19
Daily Avg	-3.0	-4.8	-0.7	1.4	6.2	8.9	11.6	12.1	10.3	5.4	1.6	-1.3

- Maximum Dew Point temperature of 18.9°C on Jul 23

- Minimum Dew Point temperature of -17.8°C on Feb 13

- Monthly Statistics for Relative Humidity %

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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Maximum	100	100	100	99	98	100	97	99	100	100	100	100
Day:Hour	9:24	11:22	8:20	17:06	10:05	14:07	28:04	2:04	6:08	25:21	6:23	1:07
Minimum	44	47	29	23	23	28	24	29	36	32	46	45
Day:Hour	21:14	3:13	30:16	25:16	14:17	15:13	11:16	22:16	17:16	5:16	26:14	11:15
Daily Avg	83	85	80	69	69	73	69	74	82	80	88	92

- Average Hourly Relative Humidity %

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
0:01- 1:00	87	89	89	80	85	86	84	89	93	89	92	94	
1:01- 2:00	87	90	90	83	85	88	85	89	93	88	92	94	
2:01- 3:00	88	90	90	84	86	90	86	90	94	89	93	94	
3:01- 4:00	86	89	90	84	86	91	88	90	94	89	92	94	
4:01- 5:00	86	90	90	85	86	91	88	91	94	89	93	95	
5:01- 6:00	87	91	89	85	86	89	87	91	92	90	93	95	
6:01- 7:00	85	89	87	83	82	85	84	89	94	89	92	95	
7:01- 8:00	84	89	85	76	74	76	75	82	91	88	92	95	
8:01- 9:00	84	88	81	68	67	70	69	75	85	84	92	94	
9:01-10:00		82	86	77	62	61	64	62	69	78	77	89	92
10:01-11:00		80	81	73	59	57	62	59	64	73	71	85	90
11:01-12:00		77	78	70	56	53	59	56	62	70	67	82	88
12:01-13:00		75	76	69	54	52	56	52	59	69	63	80	85
13:01-14:00		75	75	67	54	51	58	50	56	67	62	78	86
14:01-15:00		74	74	66	53	50	56	49	54	66	65	78	87
15:01-16:00		75	76	66	52	51	57	52	56	67	67	81	89
16:01-17:00		80	78	68	52	52	57	52	56	68	70	85	92
17:01-18:00		83	81	71	56	56	60	54	59	71	74	86	92
18:01-19:00		82	83	74	61	61	62	59	64	77	79	88	92
19:01-20:00		86	87	80	68	67	69	65	72	83	82	89	94
20:01-21:00		86	89	83	72	73	74	70	76	86	84	89	94
21:01-22:00		85	89	85	76	78	81	76	82	89	86	90	93
22:01-23:00		86	90	88	77	81	83	79	84	89	87	93	94
23:01-24:00		87	90	88	79	83	84	81	85	92	88	92	94
Max Hour	3	6	2	6	4	5	5	6	7	6	5	5	
Min Hour	15	15	15	16	15	15	15	15	15	15	14	15	13

- Monthly Indicators for Precipitation/Moisture (kPa)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.5	0.5	0.6	0.7	1.0	1.1	1.3	1.4	1.3	1.0	0.7	0.6

- Monthly Statistics for Wind Chill/Heat Index temperatures °C **

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Minimum WC	-19	-16	-21	-21	-13	-12	2		0	1	-4	-9	-17
Day:Hour	1:01	7:13	1:05	28:03	6:24	3:16		30:01	27:19	31:11	18:22	23:14	
Average WC	-8	-5	-1	0	3	6			5	7	4	0	-2
Avg Del WC	8	5	4	5	4	4			3	1	3	4	2
# Hours WC	686	444	549	492	206	74			35	109	239	547	490

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1:01- 2:00	0	0	0	0	0	0	0	0	0	0	0	0	0
2:01- 3:00	0	0	0	0	0	0	0	0	0	0	0	0	0
3:01- 4:00	0	0	0	0	0	0	0	0	0	0	0	0	0
4:01- 5:00	0	0	0	0	0	0	0	0	0	0	0	0	0
5:01- 6:00	0	0	0	0	28	27	11	0	0	0	0	0	0
6:01- 7:00	0	0	1	49	136	118	124	74	6	0	0	0	0
7:01- 8:00	0	0	56	189	256	209	243	179	74	18	0	0	0
8:01- 9:00	12	35	142	305	352	271	356	279	165	132	14	1	
9:01-10:00		69	130	163	337	386	277	319	344	300	223	53	30
10:01-11:00		107	202	161	322	373	219	388	396	307	263	94	83
11:01-12:00		120	250	231	306	388	208	397	422	316	311	157	125
12:01-13:00		120	331	231	267	394	186	445	404	321	291	160	142
13:01-14:00		116	328	242	299	412	197	485	415	311	256	129	114
14:01-15:00		130	270	231	330	416	231	405	369	297	191	93	80
15:01-16:00		62	195	232	283	379	238	351	332	241	112	34	22
16:01-17:00		4	79	174	215	324	216	311	265	146	19	0	0
17:01-18:00		0	0	56	123	210	151	192	130	29	0	0	0
18:01-19:00		0	0	0	3	56	62	72	22	0	0	0	0
19:01-20:00		0	0	0	0	0	0	0	0	0	0	0	0
20:01-21:00		0	0	0	0	0	0	0	0	0	0	0	0
21:01-22:00		0	0	0	0	0	0	0	0	0	0	0	0
22:01-23:00		0	0	0	0	0	0	0	0	0	0	0	0
23:01-24:00		0	0	0	0	0	0	0	0	0	0	0	0
Max Hour*	15	13	14	10*	15	10*	14	12	13	12	13	13	13
Min Hour	1	1	1	1	1	1	1	1	1	1	1	1	1

- Monthly Calculated "undisturbed" Ground Temperatures** °C

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.5 m	2.6	-0.6	-1.4	-0.7	3.6	8.5	13.0	16.3	17.2	15.7	12.0	7.3
2.0 m	5.5	2.5	1.1	1.0	3.3	6.6	10.2	13.2	14.8	14.5	12.4	9.2
4.0 m	7.4	5.0	3.6	3.2	4.0	5.9	8.3	10.7	12.2	12.6	11.7	9.8

- **These ground temperatures should NOT BE USED in the GroundTemperatures object to compute building floor losses.

- The temperatures for 0.5 m depth can be used for GroundTemperatures:Surface.

- The temperatures for 4.0 m depth can be used for GroundTemperatures:Deep.

- Calculations use a standard soil diffusivity of 2.3225760E-03 {m**2/day}

- Monthly Heating/Cooling Degree Days/Hours

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HDD base 10C	325	353	226	95	23	3	0	0	4	65	195	316
HDD base 18C	573	577	473	319	175	114	36	59	135	280	433	564
CDD base 10C	0	0	1	16	96	134	248	225	112	34	2	0
CDD base 18C	0	0	0	0	0	4	36	36	2	0	0	0
CDH base 20C	0	0	0	27	192	211	932	890	207	42	0	0
CDH base 23C	0	0	0	0	39	43	431	415	55	5	0	0
CDH base 27C	0	0	0	0	0	0	101	64	1	0	0	0

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- 867 annual cooling degree-days (10°C baseline)
- 1606 annual heating degree-days (10°C baseline)

- 79 annual cooling degree-days (18°C baseline)
- 3738 annual heating degree-days (18°C baseline)

- Climate type "Dfb" (Köppen classification)**
- Moist continental (warm summer, cold winter, no dry season, lat. 30-60°N)
- **Note that the Köppen classification shown here is derived algorithmically from the source weather data.
- It may not be indicative of the long term climate for this location.

- Climate type "5A" (ASHRAE Standards 90.1-2004 and 90.2-2004 Climate Zone)**
- Cool - Humid, Probable Köppen classification=Dfa, Humid Continental (Warm Summer)
- **Note that the ASHRAE classification shown here is derived algorithmically from the source weather data.
- It may not be indicative of the long term climate for this location.

- Typical/Extreme Period Determination

- Summer is Jul:Sep
 - Extreme Summer Week (nearest maximum temperature for summer)
 - Extreme Hot Week Period selected: Jul 22:Jul 28, Maximum Temp= 33.30°C, Deviation=|12.728|°C
 - Typical Summer Week (nearest average temperature for summer)
 - Typical Week Period selected: Jul 15:Jul 21, Average Temp= 16.31°C, Deviation=| 0.044|°C

- Winter is Jan:Mar
 - Extreme Winter Week (nearest minimum temperature for winter)
 - Extreme Cold Week Period selected: Feb 12:Feb 18, Minimum Temp= -16.50°C, Deviation=| 7.038|°C
 - Typical Winter Week (nearest average temperature for winter)
 - Typical Week Period selected: Jan 8:Jan 14, Average Temp= -0.04°C, Deviation=| 0.259|°C

- Autumn is Oct:Dec
 - Typical Autumn Week (nearest average temperature for autumn)
 - Typical Week Period selected: Oct 22:Oct 28, Average Temp= 4.13°C, Deviation=| 0.400|°C

- Spring is Apr:Jun
 - Typical Spring Week (nearest average temperature for spring)
 - Typical Week Period selected: Apr 1:Apr 7, Average Temp= 11.37°C, Deviation=| 0.291|°C