C202 – Definitions

COMPUTER ROOM. A room whose primary function is to house equipment for the processing and storage of electronic data and which has a design total *ITE* equipment power less than or equal to 20 watts per square foot of conditioned area or a design total *ITE* equipment load less than or equal to 10 kW.

DATA CENTER. A room (or series of rooms that share *Data Center Systems*) whose primary function is to house equipment for the processing and storage of electronic data and which has a design total *ITE* equipment power density exceeding 20 watts per square foot of conditioned area and a total design *ITE* equipment load greater than 10 kW.

DATA CENTER SYSTEMS. HVAC systems, electrical systems, equipment, or portions thereof used to condition *ITE* or electrical systems in a *data center*.

INFORMATION TECHNOLOGY EQUIPMENT (ITE). *ITE* includes computers, data storage, servers, and network/communication equipment.

C403.1 General. Mechanical systems and equipment serving heating, cooling, ventilating, and other needs shall comply with this section.

Exceptions:

1. Energy using equipment used by a manufacturing, industrial or commercial process other than for conditioning spaces or maintaining comfort and amenities for the occupants and not otherwise regulated by Sections C403.3.2, Tables C403.3.2(1) through (10) inclusive, C403.11.2, C403.11.3, C403.2.4.7, C403.4.X, C403.9.5, C404.2, Tables C404.2, C405.8, and C410. ~~Data center~~ *Data center and computer room* HVAC equipment is not covered by this exception.

2. *Data center systems* are exempt from the requirements of Sections C403.4 and C403.5.

C403.1.3 *Data Centers*. *Data center systems* shall comply with Sections 6 & 8 of ASHRAE Standard 90.4 with the following changes:

1. Replace design MLC values in the 90.4 Standard listed in Table 6.2.1.1 “Maximum Design Mechanical Load Component (Design MLC)” with the following per applicable climate zone;

Zone 4C design MLC = 0.21	Zone 5B design MLC = 0.23

2. Replace annualized MLC values in the 90.4 Standard listed in Table 6.2.1.2 “Maximum Annualized Mechanical Load Component (Annualized MLC)” with the following per applicable climate zone;

Zone 4C annual MLC = 0.16	Zone 5B annual MLC = 0.16

403.6.10 High efficiency variable air volume (VAV) systems.

14. Dedicated ~~server rooms,~~ *data centers, computer rooms,* electronic equipment rooms, telecom rooms, or other similar spaces with cooling loads greater than 5 watts/ft^2 shall be provided with separate, ~~independent HVAC~~ cooling systems to allow the VAV air handlers to

turn off during unoccupied hours in the office space and to allow the supply air temperature reset to occur.

Exception: The VAV air handling unit and VAV terminal units may be used for secondary backup cooling when there is a failure of the primary HVAC system.

Additionally, ~~server rooms, computer rooms~~ *computer rooms,* electronic equipment rooms, telecom rooms, or other similar spaces shall be provided with airside economizer per Section C403.5 without using the exceptions to Section C403.5.

C405.1 General. This section covers lighting system controls, the maximum lighting power for interior and exterior applications, electrical energy consumption, vertical and horizontal transportation systems, and minimum efficiencies for motors and transformers.

Dwelling units within multi-family buildings shall comply with Section R404.1. All other dwelling units shall comply with Section R404.1, or with Sections C405.2.5 and C405.4. Sleeping units shall comply with Section C405.2.5, and with Section R404.1 or C405.4.

Lighting installed in walk-in coolers, walk-in freezers, refrigerated warehouse coolers and refrigerated warehouse freezers shall comply with the lighting requirements of Section C410.2. Transformers, uninterruptable power supplies, motors and electrical power processing equipment in *data center systems* shall comply with section 8 of ASHRAE Standard 90.4 in addition to this code.

TABLE C403.3.2(9)
MINIMUM EFFICIENCY REQUIREMENTS: AIR CONDITIONERS AND CONDENSING UNITS SERVING COMPUTER ROOMS AND DATA CENTERS

TABLE C405.4.2(2)
INTERIOR LIGHTING POWER ALLOWANCES: SPACE-BY-SPACE METHOD

COMMON SPACE-BY-SPACE TYPES[a]	LPD[d] (w/ft^2)
Computer room, Data Center	1.33

TABLE C407.2
MANDATORY COMPLIANCE MEASURES FOR TOTAL BUILDING PERFORMANCE METHOD

Section	Title	Comments
Mechanical		
C403.1.1	Calculation of heating and cooling loads	
C403.1.3	Data Centers	

Chapter 6
REFERENCED STANDARDS

Updated Standards:

ANSI/ASHRAE 90.4 - 2016 – Energy Standard for Data Centers

As outlined in the accompanying code change proposal, these calculations are to determine the Standard 90.4 MLC values that would be calculated for a data center cooling system made up of rooftop constant volume DX units meeting the WA State Energy code. The 90.4 Standard has two compliance paths, one path concerns design (hot day, 100% and 50% load) performance, another path concerns annual performance under 100% load. Blue calculations below support the proposed design-path MLC numbers. Red calculations below support the annual-path proposed MLCs

Data Center assumptions:			
Zone ITE cooling requirement:	1240 kW		
Cooling supply air temperature:	55.0 °F		
Return air temperature:	75.0 °F		
Cooling fan & motor efficiency:	75%		
Cooling fan design static pressure:	2.8" w.c.	with econ:	3.00" w.c.
Relief fan & motor efficiency:	70%		
Relief fan design static pressure:	1.2" w.c.		
Data center design ventilation:	6,500 cfm		
Air-cooled equipment EER	10		

Data Center assumptions:			
Transformer efficiency:	96%		
UPS efficiency:	85%		
Calculated from assumptions:			
Transformer, UPS heat:	236 kW		
Cooling total airflow:	232,084 cfm		
Constant volume cooling fans' heat, without economizer:	136 kW	with econ:	146 kW
Total design cooling load without economizer:	1,376 kW	with econ:	1,386 kW
Supply fan temperature rise without economizer:	1.4 °F	with econ:	1.5 °F
Relief fan design flow energy:	63 kW		

Static Pressure (ir	Design MLC	Annual MLC
3.6	0.25	0.19
3.4	0.24	0.19
3.2	0.23	0.18
3.0	0.22	0.17
2.8	0.21	0.16
2.6	0.21	0.15
2.4	0.20	0.15
2.2	0.19	0.14
2.0	0.18	0.13

The following design conditions are stipulated by 90.4 to be used in each climate zone:

Climate zone 4C design cooling power @ 85.3°F dry bulb, 64.8°F wet bulb

Zone 4C design fan power: 136 kW

Zone 4C design entering coil wet bulb: 54°F

The cooling-power numbers below follow the Pacific NW National Lab's method for adjusting air-cooled DX performance for differing outdoor and return air conditions

see equation 19 on page 3.155 of https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-25130.pdf

Zone 4C design cooling power: 128 kW

Zone 4C air cooled DX design MLC: 0.21

Zone 4C air cooled DX annual MLC: 0.16

Zone 5B design cooling @ 98.6°F dry bulb, 65°F wet bulb

Zone 5B design fan power: 136 kW

Zone 5B design entering coil wet bulb: 54°F

Zone 5B design cooling power: 153 kW

Zone 5B air cooled DX design MLC: 0.23

Zone 5B air cooled DX annual MLC: 0.16

hour of the year:	Zone 4C (Seattle) dry bulb outdoors:	Zone 4C (Seattle) moisture ratio	Zone 4C (Seattle) wet bulb into cooling coil:	Zone 4C* (Seattle) cooling energy w/o econ:	Zone 4C (Seattle) % OSA for econ.	Zone 4C (Seattle) refr. load with econ.	Zone 4C econ. (Seattle) cooling energy with air econ:	Zone 5B (Quincy) dry bulb outdoors:	Zone 5B (Quincy) moisture ratio	Zone 5B (Quincy) wet bulb into cooling coil:	Zone 5B* (Quincy) cooling energy w/o econ:	Zone 5B (Quincy) % OSA for econ.	Zone 5B (Quincy) refr. load with econ.	Zone 5B econ. (Quincy) cooling energy with air econ:
1	37° F	0.00431	45° F	48 kW	57%	0 kW	15 kW	28° F	0.00290	42° F	31 kW	46%	10 kW	9 kW
2	36° F	0.00398	44° F	44 kW	54%	0 kW	14 kW	28° F	0.00290	42° F	31 kW	46%	10 kW	9 kW
3	36° F	0.00398	44° F	44 kW	54%	0 kW	14 kW	28° F	0.00290	42° F	31 kW	46%	10 kW	9 kW
4	34° F	0.00367	44° F	42 kW	52%	0 kW	12 kW	28° F	0.00290	42° F	31 kW	46%	10 kW	9 kW
5	34° F	0.00367	44° F	42 kW	52%	0 kW	12 kW	27° F	0.00287	42° F	29 kW	44%	9 kW	8 kW
6	34° F	0.00312	43° F	40 kW	52%	0 kW	12 kW	27° F	0.00264	42° F	29 kW	44%	9 kW	8 kW
7	36° F	0.00312	43° F	43 kW	54%	0 kW	14 kW	27° F	0.00287	42° F	29 kW	44%	9 kW	8 kW
8	36° F	0.00312	43° F	43 kW	54%	0 kW	14 kW	28° F	0.00315	43° F	33 kW	46%	10 kW	9 kW
9	36° F	0.00312	43° F	43 kW	54%	0 kW	14 kW	28° F	0.00315	43° F	33 kW	46%	10 kW	9 kW
10	36° F	0.00312	43° F	43 kW	54%	0 kW	14 kW	28° F	0.00315	43° F	33 kW	46%	10 kW	9 kW
11	37° F	0.00315	43° F	45 kW	57%	0 kW	15 kW	28° F	0.00315	43° F	33 kW	46%	10 kW	9 kW
12	39° F	0.00346	44° F	49 kW	60%	0 kW	17 kW	30° F	0.00318	43° F	36 kW	48%	11 kW	10 kW
13	41° F	0.00347	44° F	52 kW	63%	0 kW	20 kW	30° F	0.00318	43° F	36 kW	48%	11 kW	10 kW
14	39° F	0.00406	45° F	51 kW	60%	0 kW	17 kW	30° F	0.00346	44° F	37 kW	48%	11 kW	10 kW
15	37° F	0.00403	45° F	48 kW	57%	0 kW	15 kW	30° F	0.00346	44° F	37 kW	48%	11 kW	10 kW
16	34° F	0.00395	44° F	42 kW	52%	0 kW	12 kW	30° F	0.00318	43° F	36 kW	48%	11 kW	10 kW
17	34° F	0.00395	44° F	42 kW	52%	0 kW	12 kW	30° F	0.00318	43° F	36 kW	48%	11 kW	10 kW
18	34° F	0.00395	44° F	42 kW	52%	0 kW	12 kW	28° F	0.00315	43° F	33 kW	46%	10 kW	9 kW
19	34° F	0.00395	44° F	42 kW	52%	0 kW	12 kW	27° F	0.00287	42° F	29 kW	44%	9 kW	8 kW
20	34° F	0.00395	44° F	42 kW	52%	0 kW	12 kW	25° F	0.00261	42° F	27 kW	43%	8 kW	7 kW
21	34° F	0.00395	44° F	42 kW	52%	0 kW	12 kW	25° F	0.00261	42° F	27 kW	43%	8 kW	7 kW
22	34° F	0.00395	44° F	42 kW	52%	0 kW	12 kW	25° F	0.00261	42° F	27 kW	43%	8 kW	7 kW
23	34° F	0.00395	44° F	42 kW	52%	0 kW	12 kW	27° F	0.00287	42° F	29 kW	44%	9 kW	8 kW
24	34° F	0.00395	44° F	42 kW	52%	0 kW	12 kW	27° F	0.00287	42° F	29 kW	44%	9 kW	8 kW
25	34° F	0.00395	44° F	42 kW	52%	0 kW	12 kW	27° F	0.00287	42° F	29 kW	44%	9 kW	8 kW
26	34° F	0.00395	44° F	42 kW	52%	0 kW	12 kW	27° F	0.00287	42° F	29 kW	44%	9 kW	8 kW
27	34° F	0.00395	44° F	42 kW	52%	0 kW	12 kW	27° F	0.00264	42° F	29 kW	44%	9 kW	8 kW
28	34° F	0.00395	44° F	42 kW	52%	0 kW	12 kW	27° F	0.00264	42° F	29 kW	44%	9 kW	8 kW

29	34° F	0.00395	44° F	42 kW	52%	0 kW	12 kW	27° F	0.00264	42° F	29 kW	44%	9 kW	8 kW
30	34° F	0.00395	44° F	42 kW	52%	0 kW	12 kW	27° F	0.00264	42° F	29 kW	44%	9 kW	8 kW
31	34° F	0.00395	44° F	42 kW	52%	0 kW	12 kW	28° F	0.00268	42° F	31 kW	46%	10 kW	9 kW
32	34° F	0.00367	44° F	42 kW	52%	0 kW	12 kW	27° F	0.00241	41° F	27 kW	44%	9 kW	8 kW
33	32° F	0.00349	44° F	40 kW	50%	0 kW	11 kW	27° F	0.00264	42° F	29 kW	44%	9 kW	8 kW
34	34° F	0.00395	44° F	42 kW	52%	0 kW	12 kW	27° F	0.00287	42° F	29 kW	44%	9 kW	8 kW
35	36° F	0.00428	45° F	46 kW	54%	0 kW	14 kW	30° F	0.00318	43° F	36 kW	48%	11 kW	10 kW
36	39° F	0.00436	45° F	51 kW	60%	0 kW	17 kW	30° F	0.00294	42° F	34 kW	48%	11 kW	10 kW
37	38° F	0.00429	45° F	50 kW	59%	0 kW	17 kW	30° F	0.00318	43° F	36 kW	48%	11 kW	10 kW
38	37° F	0.00431	45° F	48 kW	57%	0 kW	15 kW	30° F	0.00318	43° F	36 kW	48%	11 kW	10 kW
39	37° F	0.00431	45° F	48 kW	57%	0 kW	15 kW	30° F	0.00318	43° F	36 kW	48%	11 kW	10 kW
40	37° F	0.00431	45° F	48 kW	57%	0 kW	15 kW	28° F	0.00290	42° F	31 kW	46%	10 kW	9 kW
41	37° F	0.00431	45° F	48 kW	57%	0 kW	15 kW	28° F	0.00290	42° F	31 kW	46%	10 kW	9 kW
42	37° F	0.00431	45° F	48 kW	57%	0 kW	15 kW	27° F	0.00264	42° F	29 kW	44%	9 kW	8 kW
43	37° F	0.00431	45° F	48 kW	57%	0 kW	15 kW	23° F	0.00229	41° F	22 kW	41%	7 kW	7 kW
44	36° F	0.00428	45° F	46 kW	54%	0 kW	14 kW	21° F	0.00226	41° F	20 kW	40%	7 kW	6 kW
45	37° F	0.00431	45° F	48 kW	57%	0 kW	15 kW	19° F	0.00189	40° F	16 kW	39%	6 kW	6 kW
46	37° F	0.00431	45° F	48 kW	57%	0 kW	15 kW	21° F	0.00208	40° F	18 kW	40%	7 kW	6 kW
47	36° F	0.00428	45° F	46 kW	54%	0 kW	14 kW	21° F	0.00208	40° F	18 kW	40%	7 kW	6 kW
48	37° F	0.00431	45° F	48 kW	57%	0 kW	15 kW	21° F	0.00208	40° F	18 kW	40%	7 kW	6 kW
49	36° F	0.00398	44° F	44 kW	54%	0 kW	14 kW	19° F	0.00189	40° F	16 kW	39%	6 kW	6 kW
50	37° F	0.00403	45° F	48 kW	57%	0 kW	15 kW	19° F	0.00205	40° F	16 kW	39%	6 kW	6 kW
51	37° F	0.00403	45° F	48 kW	57%	0 kW	15 kW	19° F	0.00205	40° F	16 kW	39%	6 kW	6 kW
52	37° F	0.00403	45° F	48 kW	57%	0 kW	15 kW	19° F	0.00205	40° F	16 kW	39%	6 kW	6 kW
53	37° F	0.00403	45° F	48 kW	57%	0 kW	15 kW	21° F	0.00208	40° F	18 kW	40%	7 kW	6 kW
54	36° F	0.00398	44° F	44 kW	54%	0 kW	14 kW	21° F	0.00226	41° F	20 kW	40%	7 kW	6 kW
55	34° F	0.00339	43° F	40 kW	52%	0 kW	12 kW	21° F	0.00226	41° F	20 kW	40%	7 kW	6 kW
56	34° F	0.00284	42° F	39 kW	52%	0 kW	12 kW	25° F	0.00240	41° F	25 kW	43%	8 kW	7 kW
57	32° F	0.00322	43° F	38 kW	50%	0 kW	11 kW	25° F	0.00261	42° F	27 kW	43%	8 kW	7 kW
58	30° F	0.00270	42° F	34 kW	48%	0 kW	10 kW	27° F	0.00264	42° F	29 kW	44%	9 kW	8 kW
59	30° F	0.00228	41° F	32 kW	48%	0 kW	10 kW	28° F	0.00290	42° F	31 kW	46%	10 kW	9 kW
60	30° F	0.00228	41° F	32 kW	48%	0 kW	10 kW	30° F	0.00346	44° F	37 kW	48%	11 kW	10 kW
61	30° F	0.00228	41° F	32 kW	48%	0 kW	10 kW	32° F	0.00349	44° F	40 kW	50%	12 kW	11 kW
62	30° F	0.00207	40° F	30 kW	48%	0 kW	10 kW	32° F	0.00379	44° F	40 kW	50%	12 kW	11 kW
63	30° F	0.00207	40° F	30 kW	48%	0 kW	10 kW	32° F	0.00379	44° F	40 kW	50%	12 kW	11 kW
64	28° F	0.00173	40° F	27 kW	46%	0 kW	9 kW	32° F	0.00379	44° F	40 kW	50%	12 kW	11 kW
65	28° F	0.00145	39° F	25 kW	46%	0 kW	9 kW	32° F	0.00379	44° F	40 kW	50%	12 kW	11 kW
66	28° F	0.00145	39° F	25 kW	46%	0 kW	9 kW	34° F	0.00367	44° F	42 kW	52%	14 kW	12 kW
67	27° F	0.00132	38° F	21 kW	44%	0 kW	8 kW	34° F	0.00367	44° F	42 kW	52%	14 kW	12 kW
68	27° F	0.00132	38° F	21 kW	44%	0 kW	8 kW	34° F	0.00367	44° F	42 kW	52%	14 kW	12 kW
69	27° F	0.00132	38° F	21 kW	44%	0 kW	8 kW	32° F	0.00379	44° F	40 kW	50%	12 kW	11 kW
70	27° F	0.00132	38° F	21 kW	44%	0 kW	8 kW	32° F	0.00379	44° F	40 kW	50%	12 kW	11 kW
71	27° F	0.00143	39° F	23 kW	44%	0 kW	8 kW	32° F	0.00379	44° F	40 kW	50%	12 kW	11 kW
72	27° F	0.00132	38° F	21 kW	44%	0 kW	8 kW	32° F	0.00379	44° F	40 kW	50%	12 kW	11 kW
73	25° F	0.00141	39° F	21 kW	43%	0 kW	7 kW	32° F	0.00379	44° F	40 kW	50%	12 kW	11 kW
74	25° F	0.00130	38° F	18 kW	43%	0 kW	7 kW	32° F	0.00379	44° F	40 kW	50%	12 kW	11 kW
75	25° F	0.00130	38° F	18 kW	43%	0 kW	7 kW	32° F	0.00379	44° F	40 kW	50%	12 kW	11 kW
76	25° F	0.00130	38° F	18 kW	43%	0 kW	7 kW	32° F	0.00379	44° F	40 kW	50%	12 kW	11 kW
77	25° F	0.00130	38° F	18 kW	43%	0 kW	7 kW	32° F	0.00379	44° F	40 kW	50%	12 kW	11 kW
78	25° F	0.00107	38° F	18 kW	43%	0 kW	7 kW	32° F	0.00379	44° F	40 kW	50%	12 kW	11 kW
79	25° F	0.00117	38° F	18 kW	43%	0 kW	7 kW	30° F	0.00346	44° F	37 kW	48%	11 kW	10 kW
80	25° F	0.00117	38° F	18 kW	43%	0 kW	7 kW	30° F	0.00346	44° F	37 kW	48%	11 kW	10 kW
81	25° F	0.00118	38° F	19 kW	43%	0 kW	8 kW	34° F	0.00395	44° F	42 kW	52%	14 kW	12 kW
82	27° F	0.00120	38° F	21 kW	44%	0 kW	8 kW	37° F	0.00403	45° F	48 kW	57%	17 kW	15 kW
83	27° F	0.00132	38° F	21 kW	44%	0 kW	8 kW	40° F	0.00422	45° F	52 kW	62%	21 kW	19 kW
84	28° F	0.00132	38° F	23 kW	46%	0 kW	9 kW	43° F	0.00423	45° F	56 kW	67%	25 kW	23 kW
85	28° F	0.00101	38° F	23 kW	46%	0 kW	9 kW	45° F	0.00427	45° F	58 kW	71%	29 kW	26 kW

86	30° F	0.00121	38° F	26 kW	48%	0 kW	10 kW	46° F	0.00434	45° F	61 kW	75%	33 kW	31 kW
87	28° F	0.00120	38° F	23 kW	46%	0 kW	9 kW	45° F	0.00372	44° F	57 kW	71%	29 kW	26 kW
88	28° F	0.00120	38° F	23 kW	46%	0 kW	9 kW	43° F	0.00395	44° F	54 kW	67%	25 kW	23 kW
89	28° F	0.00132	38° F	23 kW	46%	0 kW	9 kW	39° F	0.00376	44° F	49 kW	60%	19 kW	17 kW
90	27° F	0.00132	38° F	21 kW	44%	0 kW	8 kW	36° F	0.00372	44° F	44 kW	54%	15 kW	14 kW
91	27° F	0.00132	38° F	21 kW	44%	0 kW	8 kW	37° F	0.00343	43° F	45 kW	57%	17 kW	15 kW
92	25° F	0.00130	38° F	18 kW	43%	0 kW	7 kW	37° F	0.00343	43° F	45 kW	57%	17 kW	15 kW
93	25° F	0.00117	38° F	18 kW	43%	0 kW	7 kW	41° F	0.00347	44° F	52 kW	63%	22 kW	20 kW
94	25° F	0.00117	38° F	18 kW	43%	0 kW	7 kW	39° F	0.00346	44° F	49 kW	60%	19 kW	17 kW
95	23° F	0.00134	38° F	16 kW	41%	0 kW	7 kW	37° F	0.00343	43° F	45 kW	57%	17 kW	15 kW
96	19° F	0.00121	38° F	11 kW	39%	0 kW	6 kW	36° F	0.00342	43° F	43 kW	54%	15 kW	14 kW
97	21° F	0.00122	38° F	14 kW	40%	0 kW	6 kW	37° F	0.00343	43° F	45 kW	57%	17 kW	15 kW
98	19° F	0.00131	38° F	11 kW	39%	0 kW	6 kW	36° F	0.00342	43° F	43 kW	54%	15 kW	14 kW
99	19° F	0.00121	38° F	11 kW	39%	0 kW	6 kW	34° F	0.00312	43° F	40 kW	52%	13 kW	12 kW
100	21° F	0.00111	38° F	14 kW	40%	0 kW	6 kW	34° F	0.00312	43° F	40 kW	52%	13 kW	12 kW
101	21° F	0.00115	38° F	14 kW	40%	0 kW	6 kW	36° F	0.00312	43° F	43 kW	54%	15 kW	14 kW
102	21° F	0.00122	38° F	14 kW	40%	0 kW	6 kW	32° F	0.00322	43° F	38 kW	50%	12 kW	11 kW
103	21° F	0.00111	38° F	14 kW	40%	0 kW	6 kW	32° F	0.00296	42° F	36 kW	50%	12 kW	11 kW
104	19° F	0.00092	38° F	11 kW	39%	0 kW	6 kW	30° F	0.00294	42° F	34 kW	48%	11 kW	10 kW
105	23° F	0.00094	38° F	16 kW	41%	0 kW	7 kW	34° F	0.00312	43° F	40 kW	52%	13 kW	12 kW
106	25° F	0.00099	38° F	18 kW	43%	0 kW	7 kW	37° F	0.00343	43° F	45 kW	57%	17 kW	15 kW
107	28° F	0.00091	38° F	23 kW	46%	0 kW	9 kW	43° F	0.00338	43° F	53 kW	67%	25 kW	23 kW
108	28° F	0.00091	38° F	23 kW	46%	0 kW	9 kW	45° F	0.00341	43° F	56 kW	71%	28 kW	26 kW
109	28° F	0.00091	38° F	23 kW	46%	0 kW	9 kW	45° F	0.00317	43° F	56 kW	71%	28 kW	26 kW
110	28° F	0.00101	38° F	23 kW	46%	0 kW	9 kW	45° F	0.00317	43° F	56 kW	71%	28 kW	26 kW
111	28° F	0.00101	38° F	23 kW	46%	0 kW	9 kW	43° F	0.00305	42° F	52 kW	67%	25 kW	23 kW
112	28° F	0.00091	38° F	23 kW	46%	0 kW	9 kW	40° F	0.00303	42° F	48 kW	62%	21 kW	19 kW
113	27° F	0.00109	38° F	21 kW	44%	0 kW	8 kW	37° F	0.00292	42° F	44 kW	57%	17 kW	15 kW
114	27° F	0.00109	38° F	21 kW	44%	0 kW	8 kW	36° F	0.00312	43° F	43 kW	54%	15 kW	14 kW
115	27° F	0.00109	38° F	21 kW	44%	0 kW	8 kW	32° F	0.00296	42° F	36 kW	50%	12 kW	11 kW
116	27° F	0.00109	38° F	21 kW	44%	0 kW	8 kW	30° F	0.00294	42° F	34 kW	48%	11 kW	10 kW
117	27° F	0.00100	38° F	21 kW	44%	0 kW	8 kW	32° F	0.00296	42° F	36 kW	50%	12 kW	11 kW
118	27° F	0.00100	38° F	21 kW	44%	0 kW	8 kW	28° F	0.00268	42° F	31 kW	46%	10 kW	9 kW
119	27° F	0.00092	38° F	21 kW	44%	0 kW	8 kW	28° F	0.00268	42° F	31 kW	46%	10 kW	9 kW
120	27° F	0.00109	38° F	21 kW	44%	0 kW	8 kW	25° F	0.00219	40° F	23 kW	43%	8 kW	7 kW
121	27° F	0.00120	38° F	21 kW	44%	0 kW	8 kW	25° F	0.00240	41° F	25 kW	43%	8 kW	7 kW
122	27° F	0.00100	38° F	21 kW	44%	0 kW	8 kW	25° F	0.00219	40° F	23 kW	43%	8 kW	7 kW
123	28° F	0.00110	38° F	23 kW	46%	0 kW	9 kW	25° F	0.00261	42° F	27 kW	43%	8 kW	7 kW
124	28° F	0.00110	38° F	23 kW	46%	0 kW	9 kW	25° F	0.00261	42° F	27 kW	43%	8 kW	7 kW
125	27° F	0.00143	39° F	23 kW	44%	0 kW	8 kW	25° F	0.00219	40° F	23 kW	43%	8 kW	7 kW
126	27° F	0.00186	40° F	25 kW	44%	0 kW	8 kW	21° F	0.00208	40° F	18 kW	40%	7 kW	6 kW
127	27° F	0.00172	39° F	23 kW	44%	0 kW	8 kW	23° F	0.00229	41° F	22 kW	41%	7 kW	7 kW
128	25° F	0.00201	40° F	23 kW	43%	0 kW	7 kW	23° F	0.00229	41° F	22 kW	41%	7 kW	7 kW
129	24° F	0.00211	40° F	22 kW	42%	0 kW	7 kW	27° F	0.00264	42° F	29 kW	44%	9 kW	8 kW
130	25° F	0.00219	40° F	23 kW	43%	0 kW	7 kW	28° F	0.00290	42° F	31 kW	46%	10 kW	9 kW
131	26° F	0.00219	40° F	24 kW	44%	0 kW	8 kW	29° F	0.00317	43° F	35 kW	47%	10 kW	10 kW
132	27° F	0.00221	40° F	25 kW	44%	0 kW	8 kW	30° F	0.00346	44° F	37 kW	48%	11 kW	10 kW
133	28° F	0.00224	41° F	29 kW	46%	0 kW	9 kW	32° F	0.00349	44° F	40 kW	50%	12 kW	11 kW
134	28° F	0.00268	42° F	31 kW	46%	0 kW	9 kW	34° F	0.00339	43° F	40 kW	52%	13 kW	12 kW
135	28° F	0.00268	42° F	31 kW	46%	0 kW	9 kW	34° F	0.00339	43° F	40 kW	52%	13 kW	12 kW
136	28° F	0.00268	42° F	31 kW	46%	0 kW	9 kW	32° F	0.00349	44° F	40 kW	50%	12 kW	11 kW
137	28° F	0.00268	42° F	31 kW	46%	0 kW	9 kW	32° F	0.00349	44° F	40 kW	50%	12 kW	11 kW
138	28° F	0.00268	42° F	31 kW	46%	0 kW	9 kW	32° F	0.00349	44° F	40 kW	50%	12 kW	11 kW
139	30° F	0.00294	42° F	34 kW	48%	0 kW	10 kW	30° F	0.00318	43° F	36 kW	48%	11 kW	10 kW
140	32° F	0.00322	43° F	38 kW	50%	0 kW	11 kW	30° F	0.00318	43° F	36 kW	48%	11 kW	10 kW
141	32° F	0.00322	43° F	38 kW	50%	0 kW	11 kW	30° F	0.00318	43° F	36 kW	48%	11 kW	10 kW

More data available upon request to krista.braaksma@des.wa.gov