
Document Title **Electrical Load Schedule**

Project Name, Location Pollux, Sassenheim

Client Johnson and Johnson

Document Number A21LE038-IEC-001

Current Revision A

Issue Date 24 Jan 2022

Revision Description Issued for Basis of Design

Originator Mariane Badine

Technical Approval Electronically Approved

PM Approval Electronically Approved

DPS Project Number A21LE038

Client Project Number JSC-0102022

Previous Revisions							
Revision	Date	By	Check	Approvals			Revision Description
			Tech	QA	PM	Client	

Design Criteria		
1.0	Scope	
a	Estimate of electrical load for Pollux Project at current stage (BOD 30%)	
2.0	Assumptions	
a	Technical Areas	1254 m2
b	Production Areas	1374 m2
c	Support Areas	799 m2
d	Main Hall	2530 m2
e		
f		
g		
3.0	Reference Documentation	
a		
4.0	Conclusions	
a	Total load is circa 2019 kW based on calculation.	
b	Total demand load including contingency of 25% for unknown factors is 2524	
c	Assumed Cos phi 0.9, load is 2805 kVA.	
d	JnJ activities would require a supply of 4000 kVA	
e	The demand factor for small power and lighting is 1, for HVAC 0.9, for process equipment 0.6	
f	Total load without future expansion is 1131 kW based on calculation.	
h	Assumed Cos phi 0.9, load is 1257 kVA without the contingency of 25%	
i	The total building load in phase 1 is Pollux load+ Sensitech + Offices + Stability Storage = 1257 + 690 + 330 + 100 = 2377	
j	By applying a simultaneity factor of 0.8 the total building load is 1902 kVA	
Note: Process loads marked in red are estimated and the real values will be updated once received from J&J		

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Calculation			
Normal and Emergency Supply Load			
	Description of Area	Electrical load [kW]	
1	Lighting and small power	447	
2	Process Equipment	704	
3	HVAC Equipment	1090	
4	Automation system equipment	10	
5	IT, Telecom & safety systems Racks and Servers	50	
Total Connected Normal Supply electrical load [kW]		2301	
Total Demand Normal Supply electrical load [kW]		2019	
Incl. 25% contingency		2524	

Normal and Emergency Supply Load without future expansion			
	Description of Area	Electrical load [kW]	
1	Lighting and small power	257	
2	Process Equipment	352	
3	HVAC Equipment	603	
4	Automation system equipment	10	
5	IT, Telecom & safety systems Racks and Servers	50	
Total Connected Normal Supply electrical load [kW]		1272	
Total Demand Normal Supply electrical load [kW]		1131	
Incl. 25% contingency		1414	

Offices Building total estimated Load			
	Description of Area	Area [m2]	Electrical load [kW]
1	Offices	2745	412
Total Connected Normal Supply electrical load [kW]			412
Total Demand Normal Supply electrical load [kW]			329

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Calculation				
Small Power and Lighting Loads				
	Description of Area	Area [m2]	[W/m2]	Electrical load [kW]
1	Technical Areas	1254	75	94
2	Production Areas	1374	75	103
3	Support areas	799	75	60
4	Main Hall	2530	75	190
Total connected small power and lighting electrical load [kW]				447
		Demand Factor		
Total demand small power and lighting electrical load [kW]		1		447

Total connected small power and lighting electrical load without future expansion[kW]				257
		Demand Factor		
Total demand small power and lighting electrical load without future expansion [kW]		1		257

Calculation		
HVAC Loads		
	Equipment	Electrical load [kW]
1	AHU-01 IE5 motor	22
2	AEU-01 IE5 motor	15
3	AHU-01 Thermal wheel motor	0.37
4	RCU-01 unit 1 IE5 motor	18.5
5	RCU-02 unit 2 IE5 motor	37
6	EXF-01 Dedicated extract process Bio Kill	1.5
7	EXF-01 Dedicated extract process VHP	1.5
8	Booster fan Safe Change HEPA Filter	5
9	Pump distribution boiler 1	2.2
10	Pump distribution boiler 1	2.2
11	Distribution pump AHU	7.5
12	Watercontroller LTHW:	0.5
13	Pump magnetic filter LTHW:	0.25
14	FCU Cooling+Heating	0.3
15	FCU Cooling+Heating	0.3
16	FCU Cooling+Heating	0.3
17	FCU Cooling+Heating	0.3
18	FCU Cooling+Heating	0.3
19	FCU Cooling+Heating	0.3
20	FCU Cooling+Heating	0.3
21	FCU Cooling+Heating	0.3
22	FCU Cooling+Heating	0.3
23	FCU Cooling+Heating	0.3
24	FCU Cooling+Heating	0.3
25	FCU Cooling+Heating	0.3
26	FCU Cooling+Heating	0.3
27	FCU Cooling+Heating	0.3
28	FCU Cooling+Heating	0.3
29	FCU Cooling+Heating	0.3
30	Heatpump 01 Water / Water	45
31	Heatpump 01 Lucht / Water	67
32	Heatpump 02 Lucht / Water	67
33	Heatpump 03 Lucht / Water	67
34	Distribution pump AHU's	15
35	Distribution pump AHU's	15
36	Watercontroller CHW:	0.5
37	Pump magnetic filter CHW:	0.25
38	Pump Heatpump Primary	7.5
39	Dry Cooler 1	30
40	Hydrofor IE3	15
41	Break tank + hydrofor	11
42	Steamhumidifier	83
43	Electric waterheater sink 4x L0.115	7.7
44	Electric waterheater shower 4x L0.115	30.8
45	Electric waterheater Janitor L0.113	2.1
46	Electric waterheater Calibration 1x L0.112	2.1
47	Electric waterheater QC L0.318	2.1
48	Electric waterheater Locker L0.207	2.1
49	Electric waterheater Locker L0.200	2.1
50	Electric waterheater Locker L0.219	2.1
51	Electric waterheater Locker L0.220	2.1
52	Boiler for Emergency showers	4.2
53	CAV/VAV/MD Localized Control Panels	2
54	BMS Control Panel	2

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Calculation			
55	Provision for future expansion	487	
	Total connected HVAC electrical load [kW]		1090
		Demand Factor	
	Total demand HVAC electrical load [kW]	1	1090

	Total connected HVAC electrical load [kW] without future expansion		603
		Demand Factor	
	Total demand HVAC electrical load [kW] without future expansion	1	603

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Calculation			
Process Loads			
	Equipment	Tag No.	Electrical load [kW]
1	RT	1HRM-005	1
2	Refrigerator/ Walk-In Cold Room	1COL-001	7
3	MilliQ system	1WTP-001	1
4	MilliQ system	1WTP-002	1
5	RT	1HRM-006	1
6	Freezer	1FRZ-070	1.5
7	Refrigerator	1REF-004	1
8	Refrigerator	1REF-005	1
9	Freezer	1FRZ-071	1.5
10	Freezer	1FRZ-072	1.5
11	Refrigerator	1REF-001	1
12	Waterbath	1WB-001	0.5
13	Biosafety Cabinet	1BSC-001	1.5
14	Incubator	1INC-001	2
15	shaker platform	1SHK-001	0.5
16	shaker platform	1SHK-002	0.5
17	shaker platform	1SHK-003	0.5
18	shaker platform	1SHK-004	0.5
19	shaker platform	1SHK-005	0.5
20	shaker platform	1SHK-006	0.5
21	shaker platform	1SHK-007	0.5
22	shaker platform	1SHK-008	0.5
23	shaker platform	1SHK-009	0.5
24	shaker platform	1SHK-010	0.5
25	shaker platform	1SHK-011	0.5
26	shaker platform	1SHK-012	0.5
27	heating block	1EH-001	1
28	Pump	1PMP-019	0.5
29	Pump	1PMP-020	0.5
30	MES station	1MES-001	1
31	Incubator	1INC-003	2
32	Incubator	1INC-004	2
33	Incubator	1INC-005	2
34	Incubator	1INC-006	2
35	Cell counter	1CC-001	0.1
36	Biosafety Cabinet	1BSC-002	1.5
37	Incubator	1INC-002	2
38	Waterbath	1WB-002	0.5
39	Tube welder	1TUW-001	0.5
40	Tube welder	1TUW-006	0.5
41	Tube Sealer	1TSE-001	0.5
42	MES station	1MES-002	1
43	Pump	1PMP-021	0.5
44	heating block	1EH-002	1
45	biowelder	1BWD-001	1.5
46	biowelder	1BWD-002	1.5
47	Refrigerator	1REF-002	1
48	Tube welder	1TUW-002	0.5
49	Tube welder	1TUW-007	0.5
50	Tube welder	1TUW-008	0.5
51	Tube Sealer	1TSE-002	0.5
52	Tube Sealer	1TSE-003	0.5
53	Tube Sealer	1TSE-004	0.5
54	Cell counter	1CC-002	0.1

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Calculation			
Process Loads			
	Equipment	Tag No.	Electrical load [kW]
55	methabolite Analyser	1INS-001	0.1
56	methabolite Analyser	1INS-002	0.1
57	Peristaltic Pump	1PMP-001	0.5
58	Peristaltic Pump	1PMP-002	0.5
59	Peristaltic Pump	1PMP-003	0.5
60	Peristaltic Pump	1PMP-004	0.5
61	Peristaltic Pump	1PMP-017	0.5
62	Peristaltic Pump	1PMP-018	0.5
63	20L Wave Bioreactor	1WAV-001	0.5
64	20L Wave Bioreactor	1WAV-007	0.5
65	50L Wave Bioreactor	1WAV-002	0.5
66	20L Wave Bioreactor	1WAV-003	0.5
67	50L Wave Bioreactor	1WAV-008	0.5
68	50L Wave Bioreactor	1WAV-009	0.5
69	50L Wave Bioreactor	1WAV-010	0.5
70	50L Wave Bioreactor	1WAV-011	0.5
71	50L Wave Bioreactor	1WAV-012	0.5
72	50L Wave Bioreactor	1WAV-013	0.5
73	50L Wave Bioreactor	1WAV-004	0.5
74	20L Wave Bioreactor	1WAV-005	0.5
75	50L Wave Bioreactor	1WAV-006	0.5
76	MES station	1MES-003	1
77	MES station	1MES-004	1
78	biowelder	1BWD-003	1.5
79	biowelder	1BWD-004	1.5
80	Biosafety Cabinet	1BSC-003	1.5
81	Biosafety Cabinet	1BSC-004	1.5
82	Balance	1WS-001	0.1
83	Balance	1WS-002	0.1
84	Balance	1WS-003	0.1
85	Balance	1WS-004	0.1
86	Pump	1PMP-022	0.5
87	Pump	1PMP-023	0.5
88	Pump	1PMP-024	0.5
89	Pump	1PMP-025	0.5
90	Waterbath	1WB-003	0.5
91	Waterbath	1WB-004	0.5
92	Single Use Bioreactor	1FR-001	1
93	SUB Control Module	3BRM-001	0.1
94	Single Use Bioreactor	1FR-002	1
95	TCU	1TCU-001	1.5
96	TCU	1TCU-002	1.5
97	methabolite Analyser	1INS-003	0.1
98	Cell counter	1CC-003	0.1
99	Cell counter	1CC-004	0.1
100	Refrigerator	1REF-003	1
101	Freezer	1FRZ-001	1.5
102	Turbidity meter	1INS-004	0.1
103	Tube welder	1TUW-003	0.5
104	Tube Sealer	1TSE-005	0.5
105	Peristaltic Pump	1PMP-005	0.5
106	20L Wave Bioreactor	1WAV-017	1
107	Peristaltic Pump	1PMP-006	0.5
108	Peristaltic Pump	1PMP-005	0.5

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Calculation			
Process Loads			
	Equipment	Tag No.	Electrical load [kW]
109	Peristaltic Pump	1PMP-006	0.5
110	Pump	1PMP-007	0.5
111	Freezer	1FRZ-002	1
112	Biosafety Cabinet	1BSC-005	1.5
113	Tube welder	1TUW-004	0.5
114	Tube welder	1TUW-009	0.5
115	Tube Sealer	1TSE-006	0.5
116	Osmometer	1INS-005	0.1
117	ph meter	1INS-006	0.1
118	Centrifuge	1CEN-001	0.5
119	clarification skid	1CLAR-001	5
120	Jacketed mixer	1SUM-002	0.5
121	TCU	1TCU-003	1.5
122	Pump	1PMP-008	0.5
123	Pump	1PMP-026	0.5
124	Pump	1PMP-027	0.5
125	Pump	1PMP-028	0.5
126	Chromatography	1CLM-001	5
127	Filter integrity tester	1FIT-001	0.5
128	Filter integrity tester	1FIT-002	0.5
129	methabolite Analyser	1INS-007	0.1
130	20L Wave Bioreactor	1WAV-014	0.5
131	TFF	1UF-001	5
132	Tube welder	1TUW-005	0.5
133	Tube Sealer	1TSE-007	0.5
134	MES station	1MES-005	1
135	Filling Machine	1FIL-001	5
136	Isolator	1FIL-001	20
137	Tube Sealer	1TSE-008	0.5
138	manual visual inspection	1VIS-002	0.5
139	transport box	1CAR-017	0.5
140	printer	3PTR-002	0.5
141	printer	3PTR-001	0.5
142	Cart	1CAR-013	0.5
143	Cart	1CAR-014	0.5
144	reference kit	1INS-008	0.5
145	light meter	1INS-009	0.5
146	manual visual inspection booth	1VIS-001	0.5
147	MES station	1MES-006	1
148	Automated Labelling machine	1LBL-001	0.5
149	20L Wave Bioreactor	1WAV-015	0.5
150	50L Wave Bioreactor	1WAV-016	0.5
151	Peristaltic Pump	1PMP-009	0.5
152	Peristaltic Pump	1PMP-010	0.5
153	Peristaltic Pump	1PMP-011	0.5
154	Peristaltic Pump	1PMP-012	0.5
155	Single Use Bioreactor	1FR-003	1
156	SUB Control Module	3BRM-003	0.1
157	TCU	1TCU-004	1.5
158	Pump	1PMP-029	0.5
159	Peristaltic Pump	1PMP-013	0.5
160	Single Use Bioreactor	1FR-004	1
161	SUB Control Module	3BRM-002	0.1
162	TCU	1TCU-005	1.5

Calculation			
Process Loads			
	Equipment	Tag No.	Electrical load [kW]
163	Peristaltic Pump	1PMP-014	0.5
164	Bagholder mixed	1SUM-003	0.1
165	Mixed Bagholder	1SUM-004	0.1
166	clarification skid	1CLAR-002	0.5
167	Jacketed mixer	1SUM-005	0.5
168	TCU	1TCU-006	1.5
169	Pump	1PMP-016	0.5
170	clarification skid	1CLAR-003	5
171	Chromatography	1CLM-002	5
172	Jacketed mixer	1SUM-006	0.5
173	Bagholder mixed	1SUM-007	0.1
174	TFF	1UF-002	5
175	incubator	1INC-007	2
176	incubator	1INC-008	2
177	incubator	1INC-009	2
178	Biosafety Cabinet	1BSC-006	1.5
179	Biosafety Cabinet	1BSC-007	1.5
180	Pump	1PMP-030	0.5
181	Pump	1PMP-031	0.5
182	Pump	1PMP-032	0.5
183	Pump	1PMP-033	0.5
184	Refrigerator	1REF-006	1
185	Refrigerator	1REF-007	1
186	hot room	1HRM-001	3
187	hot room	1HRM-002	3
188	Air/gas samplers	1INS-010	0.1
189	Air/gas samplers	1INS-011	0.1
190	Non-viable particle counter	1INS-012	0.1
191	Non-viable particle counter	1INS-013	0.1
192	Viable particle counter	1INS-014	0.1
193	Viable particle counter	1INS-015	0.1
194	Viable particle counter	1INS-016	0.1
195	LAL reader + PC	1INS-017	0.5
196	lab autoclave + printer	1STL-002	5
197	Waterbath	1WB-005	0.5
198	Waterbath	1WB-006	0.5
199	Infrared gun thermometers	1INS-018	0.1
200	Infrared gun thermometers	1INS-019	0.1
201	Lamp for read off	1LMP-001	0.1
202	Vortex	1VX-001	0.1
203	Vortex	1VX-002	0.1
204	Dew Point meter	1INS-020	0.1
205	Dew Point meter	1INS-021	0.1
206	Dew Point meter	1INS-022	0.1
207	Anderson sampler	1INS-023	0.1
208	Anderson sampler	1INS-024	0.1
209	Smart-trak mass flowmeter	1INS-025	0.1
210	Smart-trak mass flowmeter	1INS-026	0.1
211	Room temperature controlled storage	1HRM-003	1
212	Room temperature controlled storage	1HRM-004	1
213	Lims printer	3PTR-003	0.5
214	Lims printer	3PTR-004	0.5
215	MilliQ system	1WTP-003	1
216	Freezer	1FRZ-004	1.5

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Calculation			
Process Loads			
	Equipment	Tag No.	Electrical load [kW]
217	Freezer	1FRZ-005	1.5
218	Freezer	1FRZ-006	1.5
219	Freezer	1FRZ-007	1.5
220	Freezer	1FRZ-008	1.5
221	Freezer	1FRZ-009	1.5
222	Freezer	1FRZ-010	1.5
223	Freezer	1FRZ-011	1.5
224	Freezer	1FRZ-012	1.5
225	Freezer	1FRZ-013	1.5
226	Freezer	1FRZ-014	1.5
227	Freezer	1FRZ-015	1.5
228	Freezer	1FRZ-016	1.5
229	Freezer	1FRZ-017	1.5
230	Freezer	1FRZ-018	1.5
231	Freezer	1FRZ-019	1.5
232	Freezer	1FRZ-020	1.5
233	Freezer	1FRZ-021	1.5
234	Freezer	1FRZ-022	1.5
235	Freezer	1FRZ-023	1.5
236	Freezer	1FRZ-024	1.5
237	Freezer	1FRZ-025	1.5
238	Freezer	1FRZ-026	1.5
239	Freezer	1FRZ-027	1.5
240	Freezer	1FRZ-028	1.5
241	Freezer	1FRZ-029	1.5
242	Freezer	1FRZ-029	1.5
243	Freezer	1FRZ-030	1.5
244	Freezer	1FRZ-031	1.5
245	Freezer	1FRZ-032	1.5
246	Freezer	1FRZ-033	1.5
247	Freezer	1FRZ-034	1.5
248	Freezer	1FRZ-035	1.5
249	Freezer	1FRZ-036	1.5
250	Freezer	1FRZ-037	1.5
251	Freezer	1FRZ-038	1.5
252	Freezer	1FRZ-039	1.5
253	Freezer	1FRZ-040	1.5
254	Freezer	1FRZ-041	1.5
255	Freezer	1FRZ-042	1.5
256	Freezer	1FRZ-043	1.5
257	Freezer	1FRZ-044	1.5
258	Freezer	1FRZ-045	1.5
259	Freezer	1FRZ-046	1.5
260	Freezer	1FRZ-047	1.5
261	Freezer	1FRZ-048	1.5
262	Freezer	1FRZ-049	1.5
263	Freezer	1FRZ-050	1.5
264	Freezer	1FRZ-051	1.5
265	Freezer	1FRZ-052	1.5
266	Freezer	1FRZ-053	1.5
267	Freezer	1FRZ-054	1.5
268	Freezer	1FRZ-055	1.5
269	Freezer	1FRZ-056	1.5
270	Freezer	1FRZ-057	1.5

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Calculation			
Process Loads			
	Equipment	Tag No.	Electrical load [kW]
271	Freezer	1FRZ-058	1.5
272	Freezer	1FRZ-059	1.5
273	Freezer	1FRZ-060	1.5
274	Freezer	1FRZ-061	1.5
275	Freezer	1FRZ-062	1.5
276	Freezer	1FRZ-063	1.5
277	Freezer	1FRZ-064	1.5
278	Freezer	1FRZ-065	1.5
279	Freezer	1FRZ-066	1.5
280	Freezer	1FRZ-067	1
281	Freezer	1FRZ-068	1
282	Freezer	1FRZ-069	1.5
283	Freezer	1FRZ-003	1.5
284	Autoclave	1STL-001	5
285	Compressed Air Generator Skid	1COM-001	20
286	Sump Vessel Pump 1	1PMP-001	1.1
287	Sump Vessel Pump 2	1PMP-002	1.1
288	Heat exchanger (Electrical)	1HEX-001	10
289	Recirculation pump	1PMP-003	1.5
290	Process Waste Pump	1PMP-004	1.5
291	Chemical Dosing Pump 1	1PMP-005	0.18
292	Chemical Dosing Pump 2	1PMP-006	0.18
293	Process Waste discharge Pump 1	1PMP-007	1.1
294	Process Waste discharge Pump 2	1PMP-008	1.1
295	Bund Pump	1PMP-015	1.5
296	Provision for Future expansion		352
	Total connected process equipment electrical load [kW]		704
		Demand Factor	
	Total demand process equipment electrical load [kW]	0.6	423

	Total connected process equipment electrical load without future expansion [kW]		352
		Demand Factor	
	Total demand process equipment electrical load without future expansion [kW]	0.6	211