

INITIAL CE RACK

Assume 3 CE Feedthroughs or 6 APAs

	U	Watts	
Rack Protection	1	50	estimate
Space	1		
Network Switch	1	150	S5800-48F4S 48-Port Gigabit SFP with 4 10GE SFP+ Uplinks (CE Control Links)
Space	1		
Fiber Fanout	2		
Space	1		
Slow Controls	2	200	estimate
Space	1		
CE DC Power Supply Wiener PL506/equiv	3	2360	240W/APA + IR drop - TDR states 306 Watts/APA Wiener PL506 Features: Up to 6 independent, potential free DC outputs, 600W each, total up to 3 kW output power; 85% efficient Power for 6 APAs = 6 APAs * 306 W/APA /0.85 efficiency + 200 W for controller
Fan Tray	1	90	Hoffman Rackmount Ventilation Fans - 19" Fan Tray with 6 fans HF-A19FT6B
Space	1		
CE Bias Power Supply (6 APAs) Wiener MPOD	8	464	MPOD Crate with 6 Modules Custom Modules with channels for (7) 2KV@2ma and (1) -3KV@3ma Power per custom module fully utilized with 85% efficiency 44 Watts Total power = 44W X 6 + 200 for controller = 464 Watts Additional MPOD slots could be used for fan power and Heater Control
Fan Tray	1	90	Hoffman Rackmount Ventilation Fans - 19" Fan Tray with 6 fans HF-A19FT6B
Total	24	3404	

Assume ProtoDUNE Model
Initial PD Rack

10 paddles/APA x 4 ch/paddle x 2 APA/feedthru = 80 channels; 12 ch/SSP -> 7 SSPs/feedthrough + 1 Calib Module
say we have equivalent of 8 SSPs/feedthrough or 24 SSPs for 3 feedthroughs

Rack Protection	1	50	estimate
Space	1		
Network Switch	1	150	S5800-48F4S 48-Port Gigabit SFP with 4 10GE SFP+ Uplinks (CE Control Links)
Space	1		
Fiber Fanout	2		
Space	1		
Slow Controls	2	200	estimate
Fan Tray	1	90	Hoffman Rackmount Ventilation Fans - 19" Fan Tray with 6 fans HF-A19FT6B
Space	1		
PD LV and Bias Power Supply (6 Wiener MPOD)	8	1090	MPOD Crate with 3 LV and 3 Bias Modules Qty (3) 8 channel LV Modules MPOD MPV8030; Qty (3) 8 channel Bias Module MPOD 8060 LV Power: $(1.5A \times 20V \times 24 \text{ channels} + 1.5A \times 1V \times 24 \text{ (IR DROP)}) / .85 \text{ efficiency} = 890 \text{ Watts}$ Bias Power: $(100\mu A \times 30V \times 24 \text{ channels}) / .85 \text{ efficiency} < 1 \text{ Watts}$ Total power = 890W + 200 for controller = 1090 Watts Additional MPOD slots could be used for fan power and Heater Control
Fan Tray	1	90	Hoffman Rackmount Ventilation Fans - 19" Fan Tray with 6 fans HF-A19FT6B
	20	1670	

SC/INSTR RACK

Assume 3 CE Feedthroughs or 6 APAs

	U	Watts	
Rack Protection	1	50	estimate
Space	1		
Network Switch	1	150	S5800-48F4S 48-Port Gigabit SFP with 4 10GE SFP+ Uplinks (CE Control Links)
Space	1		
Fiber Fanout	2		
Space	1		
Slow Controls	2	200	estimate
Space	1		
MISC INSTR Power Supplies Wiener MPOD	8	1000	MPOD Crate with 6 Modules ESTIMATE 1000 Watts CE fans and Heaters Cameras, Purity Monitor, ... Misc
Fan Tray	1	90	Hoffman Rackmount Ventilation Fans - 19" Fan Tray with 6 fans HF-A19FT6B
Space	1		
MISC INSTR RDOU	8	1000	Miscellaneous Readout Equipment ESTIMATE 1000 Watts RTDs, Cameras, Pressure sensors, ... Misc
Fan Tray	1	90	Hoffman Rackmount Ventilation Fans - 19" Fan Tray with 6 fans HF-A19FT6B
Total	29	2580	

PD Mini Proximity RACK

Assume ProtoDUNE like electronics

	U	Dissipated Load (Watts)	
Rack Protection	1	50	?estimate
Space	1		
SSP	1	30	
SSP	1	30	
SSP	1	30	
SSP	1	30	
Space	1		
SSP	1	30	
SSP	1	30	
SSP	1	30	
SSP	1	30	
Space	1		
Total	12	290	

CE RACK - Balance Power

Assume 3 CE Feedthroughs or 6 APAs

	U	Watts	
Rack Protection	1	50	estimate
Space	1		
Network Switch	1	150	S5800-48F4S 48-Port Gigabit SFP with 4 10GE SFP+ Uplinks (CE Control Links)
Space	1		
Fiber Fanout	2		
Space	1		
Slow Controls	2	200	estimate
Space	1		
CE DC Power Supply Wiener PL506/equiv	3	2360	240W/APA + IR drop - TDR states 306 Watts/APA Wiener PL506 Features: Up to 6 independent, potential free DC outputs, 600W each, total up to 3 kW output power; 85% efficient Power for 6 APAs = 6 APAs * 306 W/APA /0.85 efficiency + 200 W for controller
Fan Tray	1	90	Hoffman Rackmount Ventilation Fans - 19" Fan Tray with 6 fans HF-A19FT6B
Total	14	2850	

Assume ProtoDUNE Model
PD/CE Rack - Balance Power

10 paddles/APA x 4 ch/paddle x 2 APA/feedthru = 80 channels; 12 ch/SSP -> 7 SSPs/feedthrough + 1 Calib Module
 say we have equivalent of 8 SSPs/feedthrough or 24 SSPs for 3 feedthroughs

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Space	1		
Network Switch	1	150	S5800-48F4S 48-Port Gigabit SFP with 4 10GE SFP+ Uplinks (CE Control Links)
Space	1		
Fiber Fanout	2		
Space	1		
Slow Controls	2	200	estimate
Fan Tray	1	90	Hoffman Rackmount Ventilation Fans - 19" Fan Tray with 6 fans HF-A19FT6B
Space	1		
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	30	2224	