

Revisiting the Klystron Heat Loads

60% efficiency

CPI	VKL-8301	
Po	10	Mw
Pulse Width	1.565	ms
Rep Rate	5	Hz
duty	0.78%	
Ek	120	kV
Ik	139	A
Input Power	131	kW
Po (avg)	78	kW
efficiency	60%	
heat with drive	52.3	kW
Body magnet	3.2	kW
Collector mag	1.8	
Socket tank	1.0	heater
Windows	0.5	
TOTAL	58.7	kW

65% efficiency

CPI	VKL-8301	
Po	10	Mw
Pulse Width	1.565	ms
Rep Rate	5	Hz
duty	0.78%	
Ek	116	kV
Ik	132	A
Input Power	120	kW
Po (avg)	78	kW
efficiency	65%	
heat with drive	41.7	kW
Body magnet	3.2	kW
Collector mag	1.8	
Socket tank	1.0	heater
Windows	0.5	
TOTAL	48.1	kW

Reduce Klystron Heat Load to 50 kW total assuming 65% eff. At normal operating conditions

Non-normal Operating Conditions:

1. Reduce power to Cavities by reducing voltage
=>reduced heat load
2. Reduce rep rate if rf drive is zero from 5Hz to 3Hz...

but

no power out and 3 Hz

CPI	VKL-8301	
Po	10	Mw
Pulse Width	1.565	ms
Rep Rate	3	Hz
duty	0.47%	
Ek	116	kV
Ik	132	A
Input Power	72	kW
Po (avg)	0	kW
efficiency	0%	
heat with drive	71.9	kW
Body magnet	3.2	kW
Collector mag	1.8	
Socket tank	1.0	heater
Windows	0.5	
TOTAL	78.4	kW

Current Total Klystron Heat Load

Klystron Socket Tank	1.00
Klystron Focusing Coil	8.40
Klystron Collector	61.00
Klystron Body	10.00
Klystron Windows	0.50
Total	80.90

Current Total Klystron Heat Load covers 3Hz operation with no drive.