

Abstract Submitted  
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**Engineering design of the PLX- $\alpha$  coaxial gun**<sup>1</sup> E. CRUZ, S. BROCK-  
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— We describe the engineering and technical improvements, as well as provide a  
detailed overview of the design choices, of the latest PLX- $\alpha$  coaxial gun designed for  
the 60-gun scaling study of spherically imploding plasma liners as a standoff driver  
for plasma-jet-driven magneto-inertial fusion [1]. Each coaxial gun incorporates a  
fast, dense gas injection and triggering system, a compact low-weight pfn with in-  
tegral sparkgap switching, and a contoured gap designed to suppress the blow-by  
instability [2]. The evolution of the latest Alpha gun is presented with emphasis on  
its upgraded performance. Changes include a faster more robust gas valve, better-  
quality ceramic insulator material and enhancements to overall design layout. These  
changes result in a gun with increased repeatability, reduced potential failure modes,  
improved fault tolerance and better than expected efficiency. A custom 600- $\mu$ F, 5-  
kV pfn and a set of six inline sparkgap switches operated in parallel are mounted  
directly to the back of the gun, and are designed to reduce inductance, cost, and  
complexity, maximize efficiency and system reliability, and ensure symmetric current  
flow. [1] Hsu et al., IEEE Trans. Plasma Sci. 40, 1287 (2012). [2] Witherspoon et  
al., Rev. Sci. Instr. 80, 083506 (2009).

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