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HPRF SSPA System for RAON SRF cavities

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The heavy-ion accelerator of the Rare Isotope Science Project (RISP) in Korea has been developed. There are three types of SRF cavity, which are 81.25MHz quarter-wave resonator (QWR), 162.5MHz half-wave resonator (HWR), 325MHz single-spoke resonator (SSR). There are 22 QWRs and 102 HWRs in the superconducting linac#3 (SCL3), and 69 SSR1s and 144 SSR2s in the superconducting linac#2 (SCL2). The required RF power is 4kW for each QWR, 4kW for each HWR, 8kW for each SSR1, and 20kW for each SSR2. The high power RF SSPAs for the SRF cavities have been developed and fabricated with domestic companies. 325MHz 20kW SSPAs have been designed and fabricated to test the prototype of the SSR2 SRF cryomodule including six SSR2 cavities. They were designed to enable full-reflection operation at all times. It consists of four 6kW power-units, four 6kW circulator units, 4-way combiner, a control unit, a power distribution unit, and cooling water inlet/outlet manifolds in each 19" rack. The power-unit has six 1.2kW pallets and circulators, and three power packs. This paper describes the design and fabrication of the SSPA systems for the RAON SRF cavities.

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