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Mon-Mo-Po1.03-12 [32]: Final focus superconducting magnets for CEPC

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Circular Electron Positron Collider (CEPC) with a circumference about 100 km, a beam energy up to 120 GeV is proposed to be constructed in China. Most magnets for CEPC accelerator are conventional magnets, except some superconducting magnets are required in the interaction region of CEPC collider ring. High gradient final focus doublet quadrupoles QD0 and QF1 are required on both sides of the collision points in the interaction region of CEPC collider ring to achieve high luminosity. QD0 and QF1 are both double aperture superconducting quadrupoles with a central field gradient of 136 T/m and 110 T/m, respectively. The field crosstalk between the two apertures in the quadrupoles should be solved. Since the final focus superconducting quadrupoles are operated inside the field of the Detector solenoid magnet with a central field of 3.0 T, strong superconducting anti-solenoid is need to cancel the Detector solenoid field and minimize the effect of the solenoid field on the beam. In this paper, the layout and magnetic design of CEPC final focus superconducting magnets are described, and the R&D status of prototypes superconducting magnets is presented.

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