

Barrel Toroid

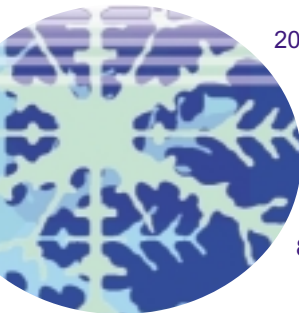
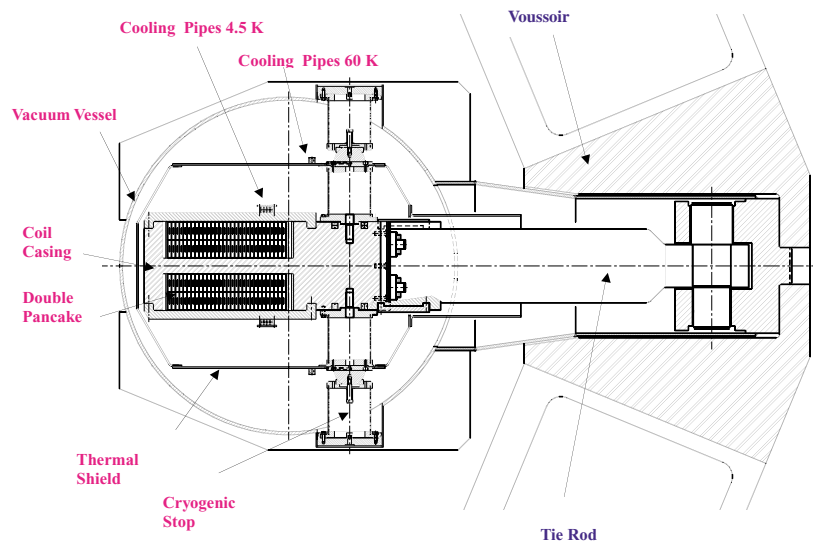
The Barrel Toroid (BT) comprises eight flat racetrack coils, each consisting of two double-pancake windings embedded in an aluminium alloy coil casing.

The eight individual vacuum vessels are connected through the cryogenic ring for electrical and cryogenic interconnection. The warm structure, comprising eight voussoir rings and eight strut rings, supports the coils by means of eight tie rods. The cold mass support system consists of eight tie rods and 32 cryogenic stops. The whole assembly is supported on feet. Full redundancy is implemented through two cooling circuits: 4.5 K liquid helium for the cold masses and 60 K high-pressure helium gas for the thermal shields. Each BT coil will be integrated and tested at CERN before underground installation.

The model coil B0, with a reduced length of 9 m and the same cross-section, was built to validate the manufacturing cycle and related technologies; it was successfully tested in 2001.

Parameters

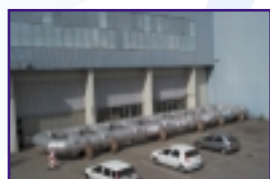
- 20 m diameter
- 25 m length
- 8 coils, 16 double pancakes
- 1.1 GJ stored energy
- 56 km Al-NbTi conductor
- 320 tons cold mass
- 850 tons weight



Double pancake



Helium cooling pipes for BT cold mass



BT vacuum vessel



BT assembly



Coil casing