CEPC Booster and Collider RF Power Distribution System Design

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Jun.15 2020

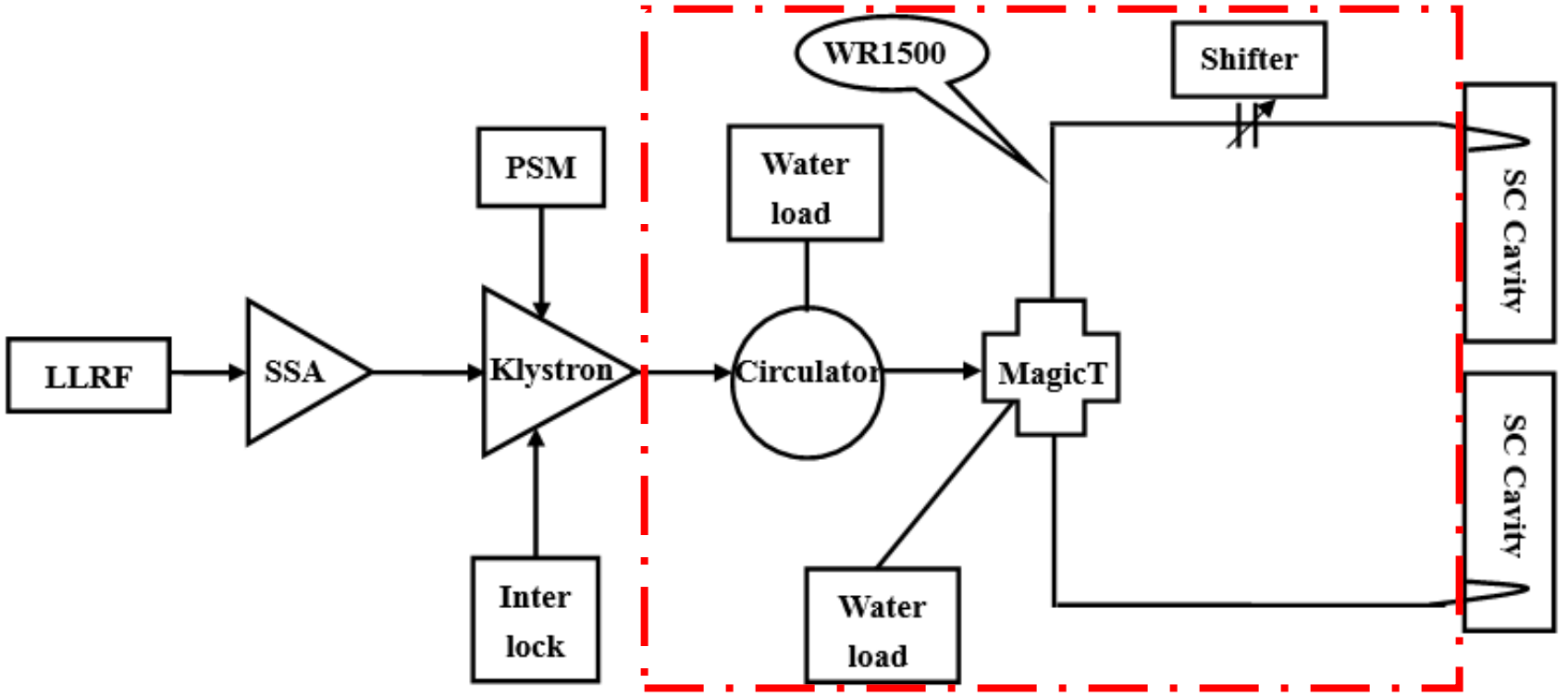
Outline

① Collider ring
② Booster
③ Key components R&D Progress
④ Future plan

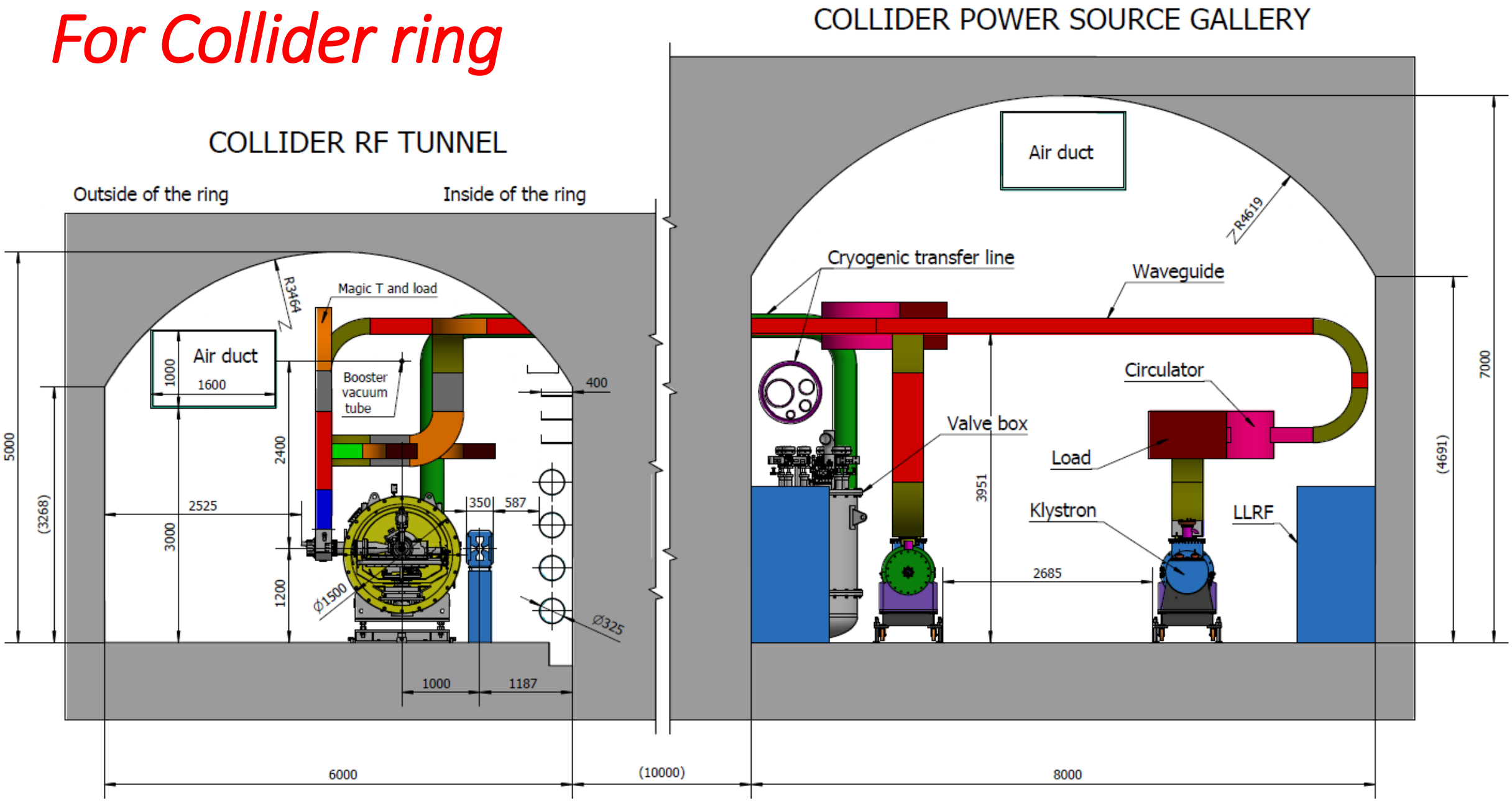
For Collider ring

RF Power Distribution System

From **Klystron output window** to **SC cavity coupler**



For Collider ring



System components

1 SET SYSTEM including:

Name		Parameters	QTY	China-made
W.G.	Straight	WR1500, 800kW/400kW	Some segments	Mature
	Miter Bend	WR1500, 800kW/400kW	Some segments	Mature
	Flexible	WR1500, 800kW/400kW	Some segments	To be developed
	Directional coupler	Directivity>25dB	Some segments	Mature
Circulator		Isolation>26	1	Under development
Load		800kW	2	Under development
Magice Tee		800kW	1	Mature
Phase Shifter		360degree	1	Mature

120 SET at CEPC collider ring

Key components cover space

Circulator

（2.5m×2.5m）

Load

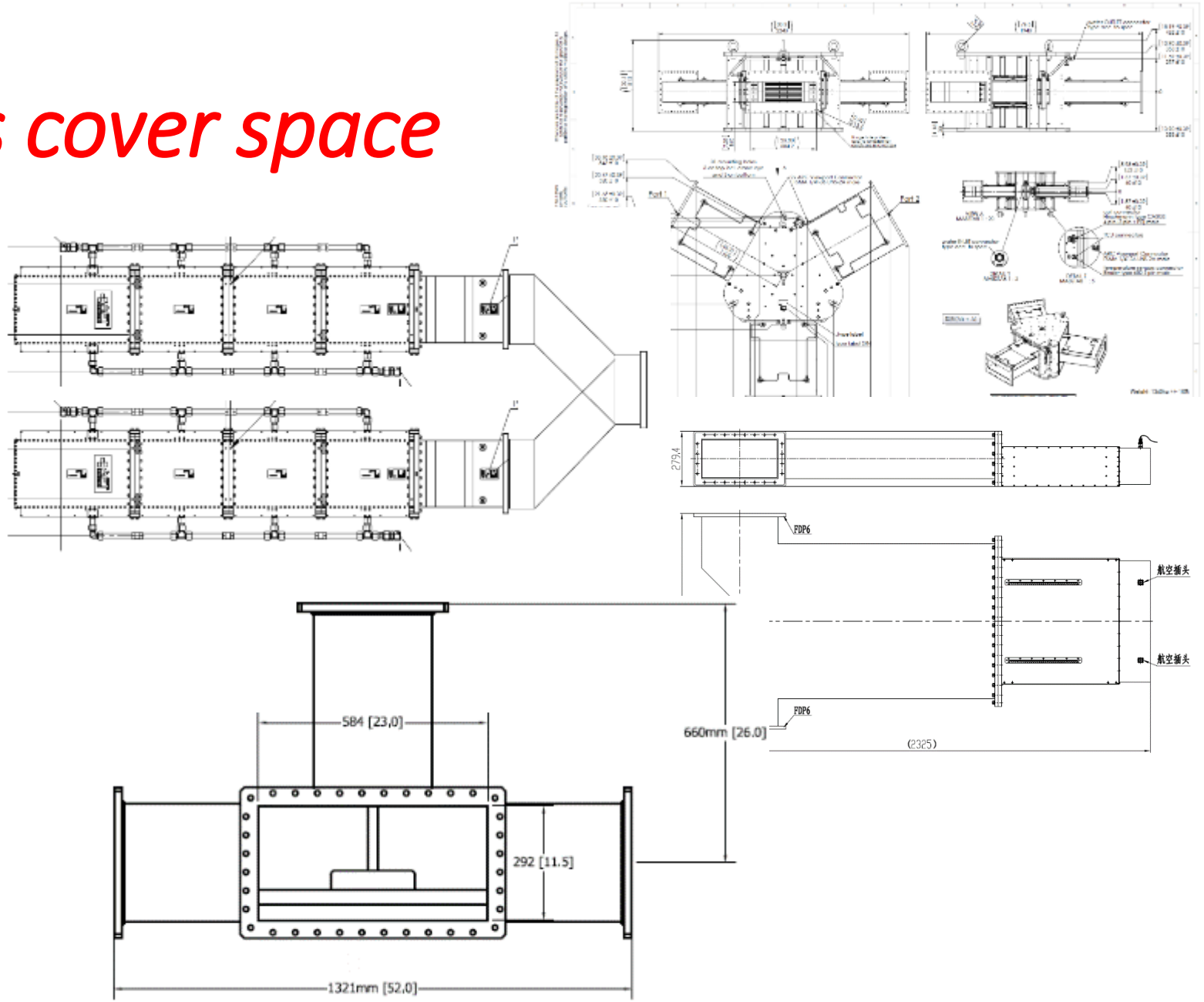
（4.0m×2.0m）

Phase shifter

（2.3m×1.1m）

Magic Tee

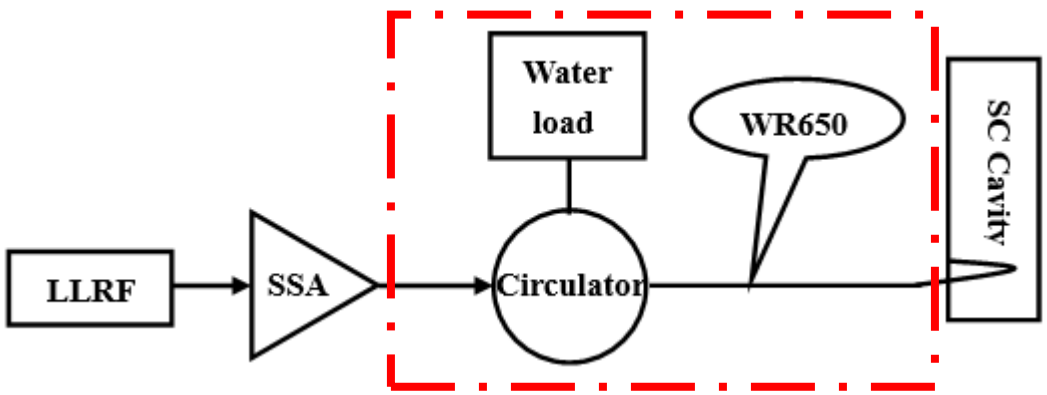
（1.3m×1.1m）

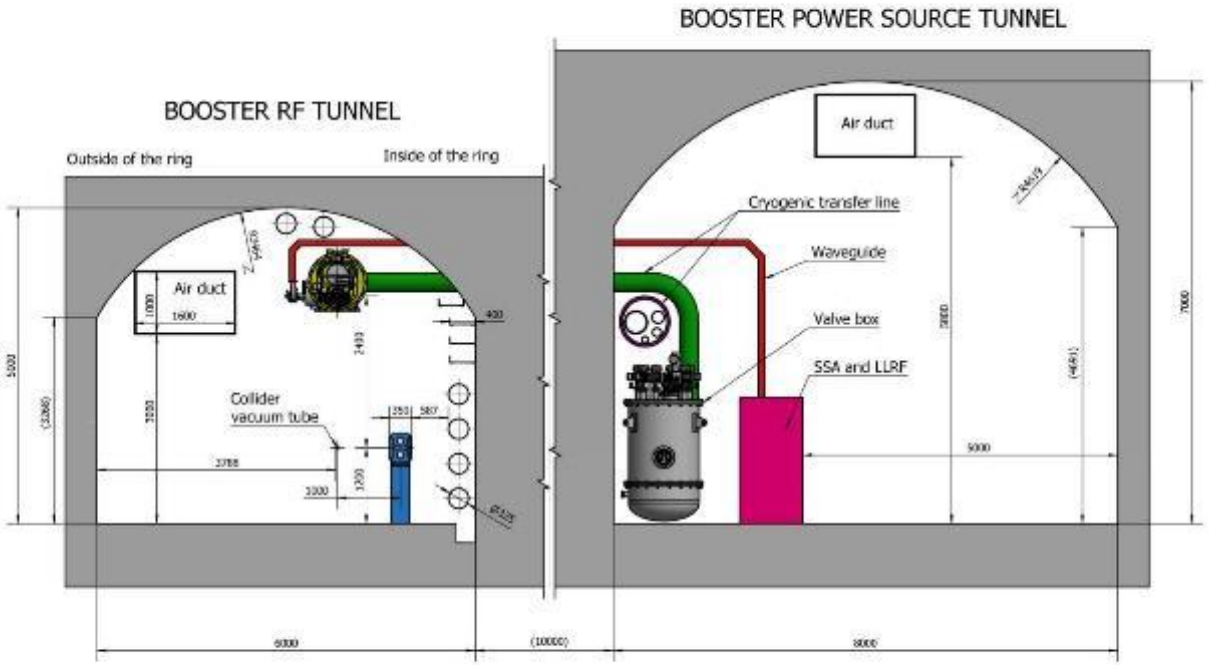


For Booster

RF Power Distribution System

From **Solid State Amplifier** to **SC cavity coupler**





System components

1 SET SYSTEM including:

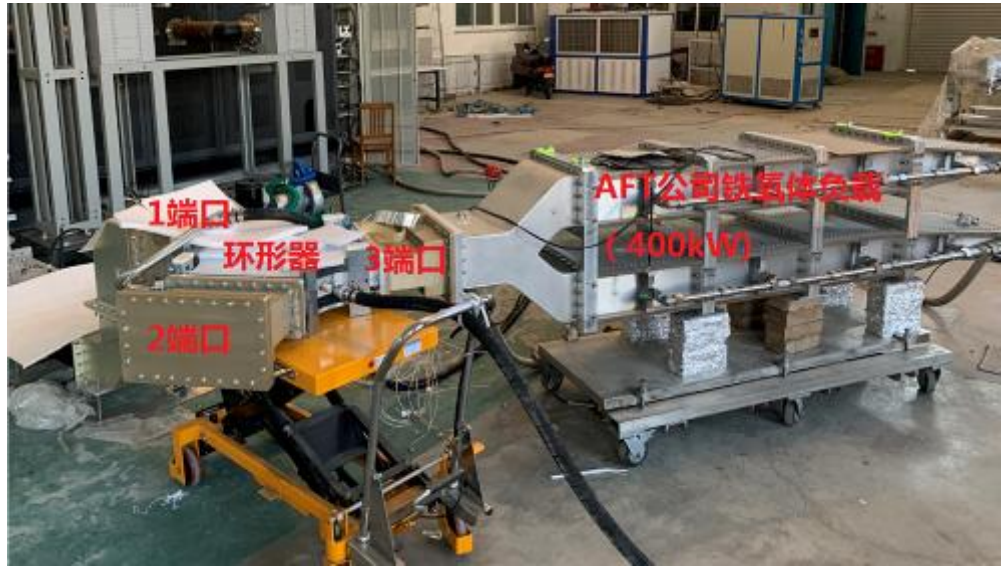
Name		Parameters	QTY	China-made
W.G.	Straight	WR650, 25kW	Some segments	Mature
	Miter Bend	WR650, 25kW	Some segments	Mature
	Flexible	WR650, 25kW	Some segments	To be developed
	Directional coupler	Directivity>25dB	Some segments	Mature
Circulator		Isolation>26dB	1	Mature
Load		25kW	1	Mature

96 SET at CEPC Booster

Key components R&D progress

650MHz/800kW **Circulator**

- High power conditioning and test for 1st single layer is completed.
- 160kW full reflected power operation well.
- No arcing happened.
- The another 3 layers processing is going well.
- High power test for circulator will be done on this August.



Key components R&D progress

650MHz/800kW **Load**

- The 800kW load includes 4x200kW branches, the first branch(200kW) load is completed assembly and waiting for high power test.
- Other 3x200kW branches will be completed fabrication at the end of this month and then deliver to IHEP for high power test.

Future plan

- Development on circulator and load will be completed this year.
- Mechanical design for distribution system will be detailed and updated.**(need more mechanical designers' help)**

Thank you for your attention