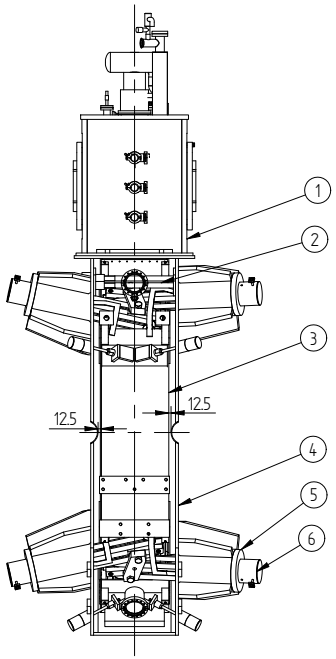
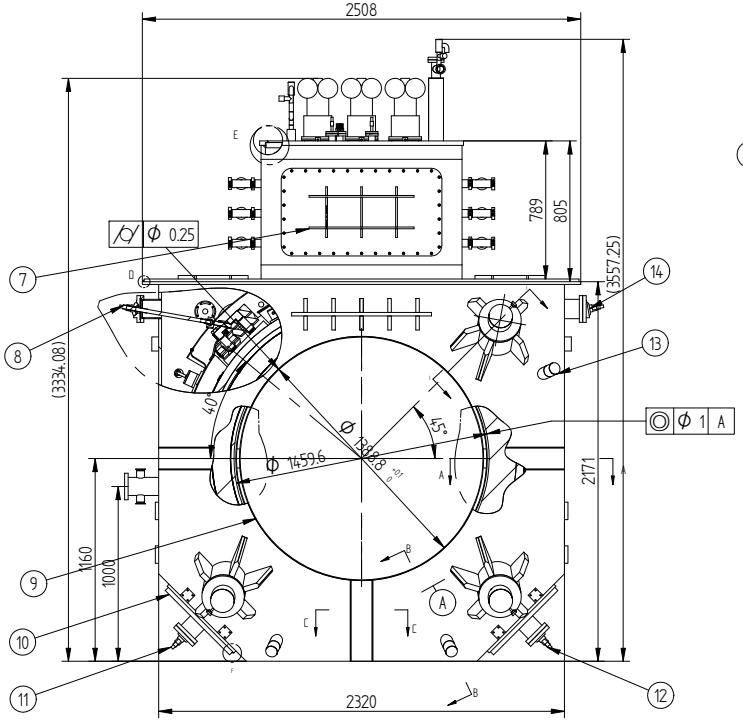
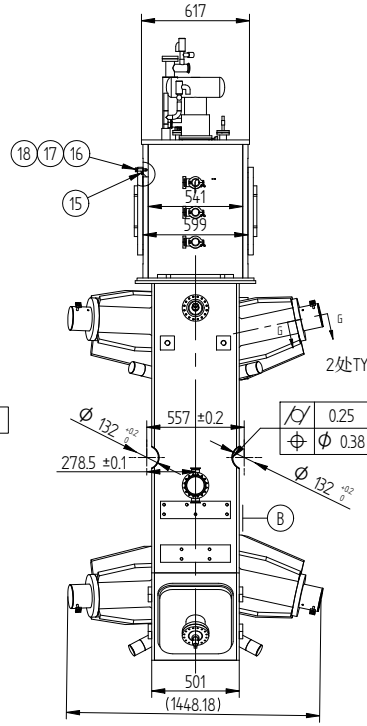
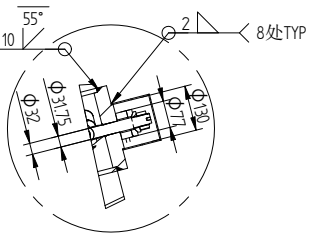
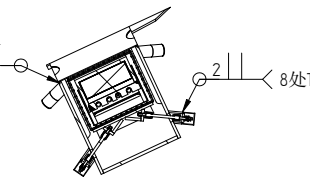




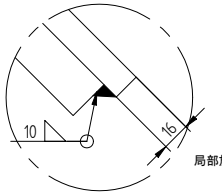




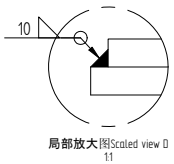
剖面Section G-G 1:5



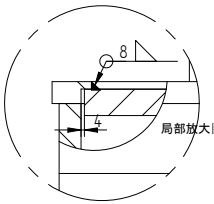
剖面Section B-B 1:10



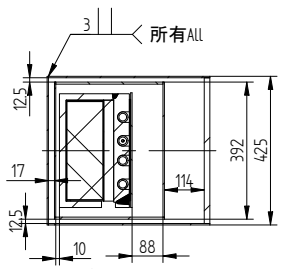
局部放大图Scaled view F 1:1



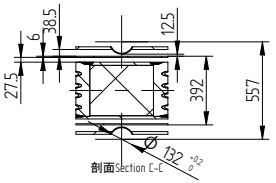
局部放大图Scaled view D 1:1



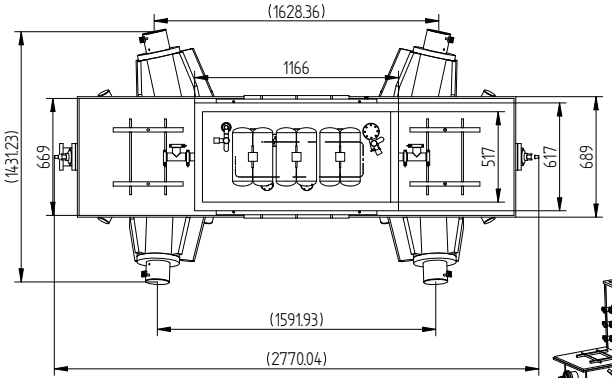
局部放大图Scaled view E 1:2

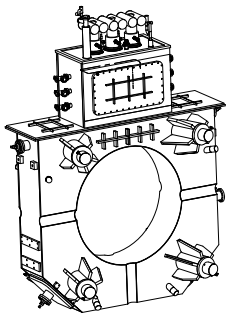


剖面Section A-A 1:5



剖面Section C-C





技术要求 Technical Req.：

1. 所有材料均需提供材料质量证明书。All material need to be certified.
2. 所有不锈钢材料的焊接均采用氩弧焊，焊丝牌号为 H0Cr21Ni10。St. steel parts shall be welded with argon-arc welding method and H0Cr21Ni10 solder.
3. 所有元件在焊接和装配前需清洁处理，去除油脂、污物、灰尘等，并干燥保存，具体参见“MICE 冷质量和低温恒温器清洗及焊接程序”。 Clean all parts before welding or assembly and keep dry. All requirements written in “Cleaning and Welding Procdure for MICE Cold Mass and Cryostat” shall be compiled.
4. 焊接完成后必须对焊缝进行外观检查，焊缝表面不得有裂缝、气孔、夹渣及咬边等焊接缺陷，按 JB4730 无损检测要求，对接焊缝进行射线无损检测，II 级为合格，其他焊缝进行渗透检测，I 级为合格，参见“MICE 冷质量和低温恒温器清洗及焊接程序”。Visually check welding seams, they shall be defect free. X ray inspect all seamwelding and shall be graded II; and comply JB4730 procedure. Conduct dye penetration test on other welding and shall be graded I. Refer to “Cleaning and Welding Procedure for MICE Cold Mass and Cryostat”.
5. 所有冷质量、冷屏、支撑拉带等低温表面均需包扎多层绝热材料（MLI），包扎要求及方法见“MICE/MuCool 超导耦合磁体多层绝热材料 MLI 包扎技术说明书”。All surfaces of cold mass, thermal shield and its support shall be wrapped with MLI, refer to “MICE/MuCool Superconding Coupling Magnet MLI Wrapping Procedure”.
6. 冷质量在焊接上部冷却管路前，应分别带冷屏和不带冷屏与真空容器进行试安装，试断点，对冷质量、冷质量支撑、冷屏支撑以及上述部件间的配合和间隙进行检查，参见“MICE/MuCool 超导耦合磁体系统主要设计技术参数及生产验收要求”。 Before weld cooling pipes to the cold mass, trail assembling the cold mass to vacuum vessel with and without the thermal shield shall be conducted; the trail survey shall be done as well. The mating and gaps between all fitting and connections shall be checked. Refer to “MICE/MuCool Superconduct Coupling Magnet System Parameters and Production & Acceptance Requirements”.
7. 容器按 GB150-1998《钢制压力容器》进行制造，检验和验收，GB150-1998 (Steel Pressure Vessel) shall be compiled for vacuum vessel fabrication, test and acception inspection shall comply.
8. 容器表面光洁，不得有划痕，刻槽等缺陷。All surface shall be scratch and defect free.
9. 容器及其管道上各焊缝需经氦质谱仪检漏，漏率<1×10^{-9}Pa·m^3/s。参见“MICE 冷质量和低温恒温器真空检漏程序”。 Refer to “Vacuum Leak Check Procedure for MICE Cold Mass and Cryostat”, use the He leak detector to test all welding seams and leakage shall be <1×10-10Pa•m3/s.
10. O 形圈及相应密封件在安装时均匀涂抹薄层真空脂，容器各密封面须经氦质谱仪检漏，漏率<1×10^{-9}Pa·m^3/s。参见“MICE 冷质量和低温恒温器真空检漏程序”。 Evenly apply thin vacuum grease to O ring and sealing groove during assembly. Refer to “Vacuum Leak Check Procedure for MICE Cold Mass and Cryostat”, use the He leak detector to test all sealing surfaces and leakage shall be <1×10-10Pa•m3/s.
11. 容器组焊总装后，用干燥氮气进行压力试验，试验压力 0.125MPa。具体参见 GB150。Comply to GB150, conduct pressure test with dry Nitrogen gas under 0.125Mpa, after vessel welding.
12. 总装后，真空室在常温时，真空度应好于 1×10 $^{-5}$Pa. After assembly, the vacuum degree of vacuum vessel shall be > 1×10 $^{-5}$Pa under room temperature.
13. 容器安装检验完毕后，整体运输前，应在内部充上 0.1MPa 的干燥氮气。After inspection before shipping, fill 0.1Mpa dry nitrogen gas into vessel.
14. 超导耦合磁体线圈及冷质量组件对地绝缘电压应≥5Kv，最大漏电流为 200 μ A。Ground insulation of superconducting coil and cold mass shall be ≥5Kv.

18	GB/T 95	平垫圈 12	65 MN	1	304		0.0 kg	
17	GB/T 93	弹簧垫圈 12	65 MN	1	304		0.0 kg	
16	GB/T 5780	六角头螺栓 M24×65	65 MN	1	304		0.1 kg	
15	MMSF-0000-0003	螺钉圈	6-ON 100 VACUUM VESSEL SUPPORT RING	6			0.0 kg	
14	MMSF-1200-0000	低温组件1件3 THIRDPART SUPPORT RING ASSEMBLY		1			10.8 kg	
13	MMSF-1100-0000	冷屏支撑装置组件	COLD MASS THERMAL SHIELD SUPPORTS ASSEMBLY	8			3.1 kg	
12	MMSF-1200-0000	低温组件1件4 THIRDPART SUPPORT ROD ASSEMBLY		1			9.7 kg	
11	MMSF-0900-0000	低温组件1件2 THIRDPART SUPPORT ROD ASSEMBLY		1			9.7 kg	
10	MMSF-0800-0000	真空室主管道组装总任务	MAIN VACUUM PIPE ASSEMBLY	2			80.9 kg	
9	MMSF-0000-0002	真空室2#门板	VACUUM VESSEL DOOR END PLATE	1	304		67.8 kg	
8	MMSF-0700-0000	低温组件1件1 THIRDPART SUPPORT ROD ASSEMBLY		1			10.8 kg	
7	MMSF-1600-0000	真空室上部容器组合件	VACUUM VESSEL UPPER CONTAINER ASSEMBLY	2			200.7 kg	
6	MMSF-0500-0000	冷质量支撑真空室	VACUUM VESSEL COLD MASS SUPPORT ASSEMBLY	8			14.0 kg	
5	MMSF-0000-0001	冷质量支撑真空盖组装	VACUUM VESSEL COLD MASS SUPPORT COVER	8	304		13.0 kg	
4	MMSF-0400-0000	真空室主容器	VACUUM VESSEL MAIN BODY	1			1760.2 kg	
3	MMSF-0300-0000	冷质量及冷屏	COLD MASS AND THERMAL SHIELD	1			0.0 kg	
2	MMSF-0200-0000	真空室2#大维件	VACUUM VESSEL END PLATE WELDMENT	4			67.8 kg	
1	MMSF-0100-0000	真空室上部容器组合件	VACUUM VESSEL THIRDPART WITH RF TWO	1			980.6 kg	
序号	代号	名称	数量	材料	计重	总重	备注	

设计				SSRF上海光源	
绘图					
校核					
审核		计算机文件名	27H700_MMSF-0000-0000.dft		
会签		制图软件	Solid Edge	MICE超导耦合磁铁	
		数量	重量 比例	图幅	
审定		1	1:10	A0	
批准		共 1 张	第 张	MMSF-0000-0000	版本 A

A				INITIAL REVISION					
REV.	AUTHOR	APPROVED	DATE	CHANGE DESCRIPTION					

DO NOT SCALE DRAWING
UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN MILLIMETERS AND TOLERANCES ARE AS FOLLOWS UNLESS OTHERWISE SPECIFIED

PROJECT NAME: MICE

SCALE: 1:1 WT: 0 KG

SHEET 1 OF 1

ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA
MUON IONIZATION COOLING EXPERIMENT (MICE)
MICE/MUCOOL SUPERCONDUCTING COUPLING MAGNET
TYPE: MMSF-0000-0000

1 5 27H700 A