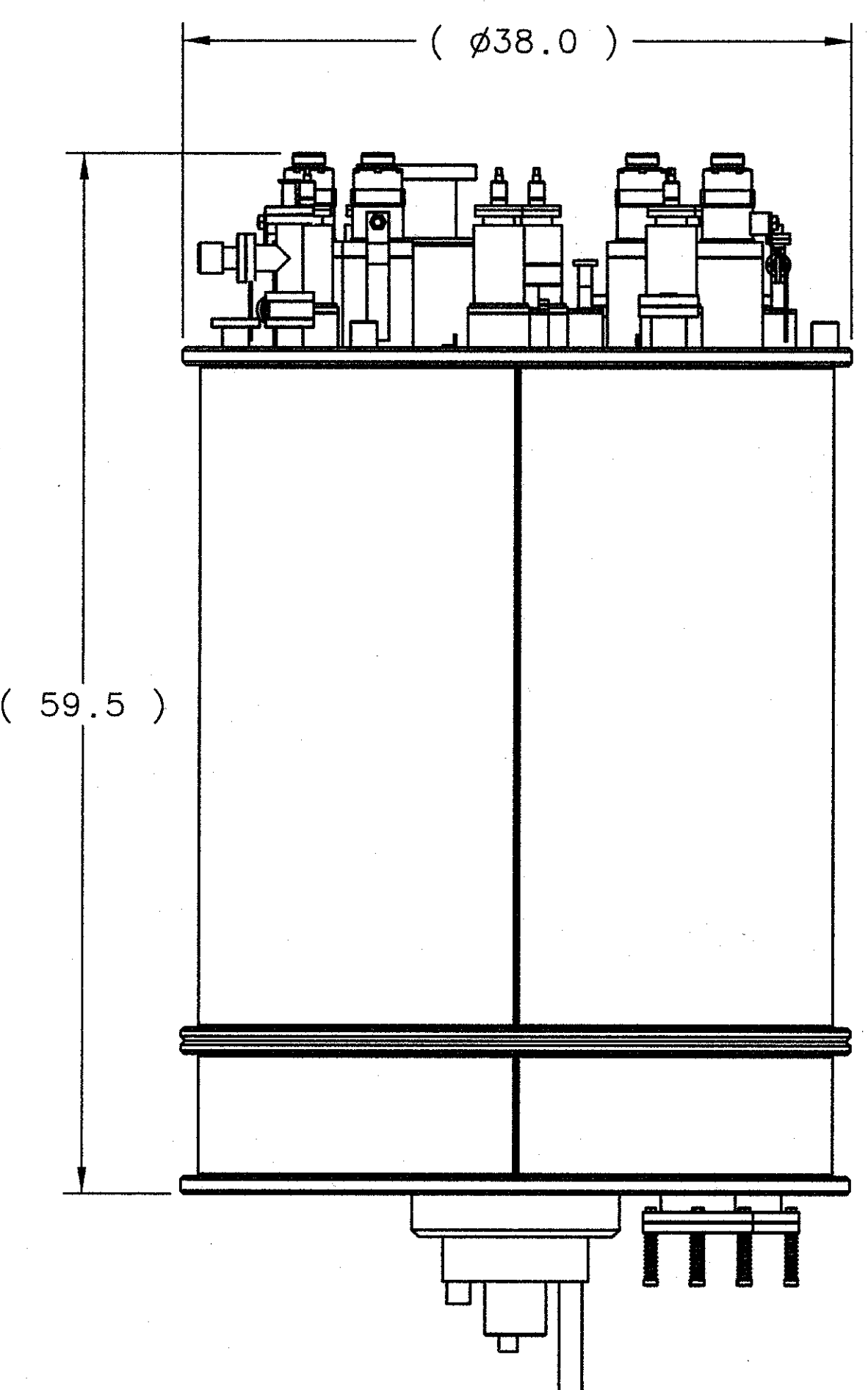
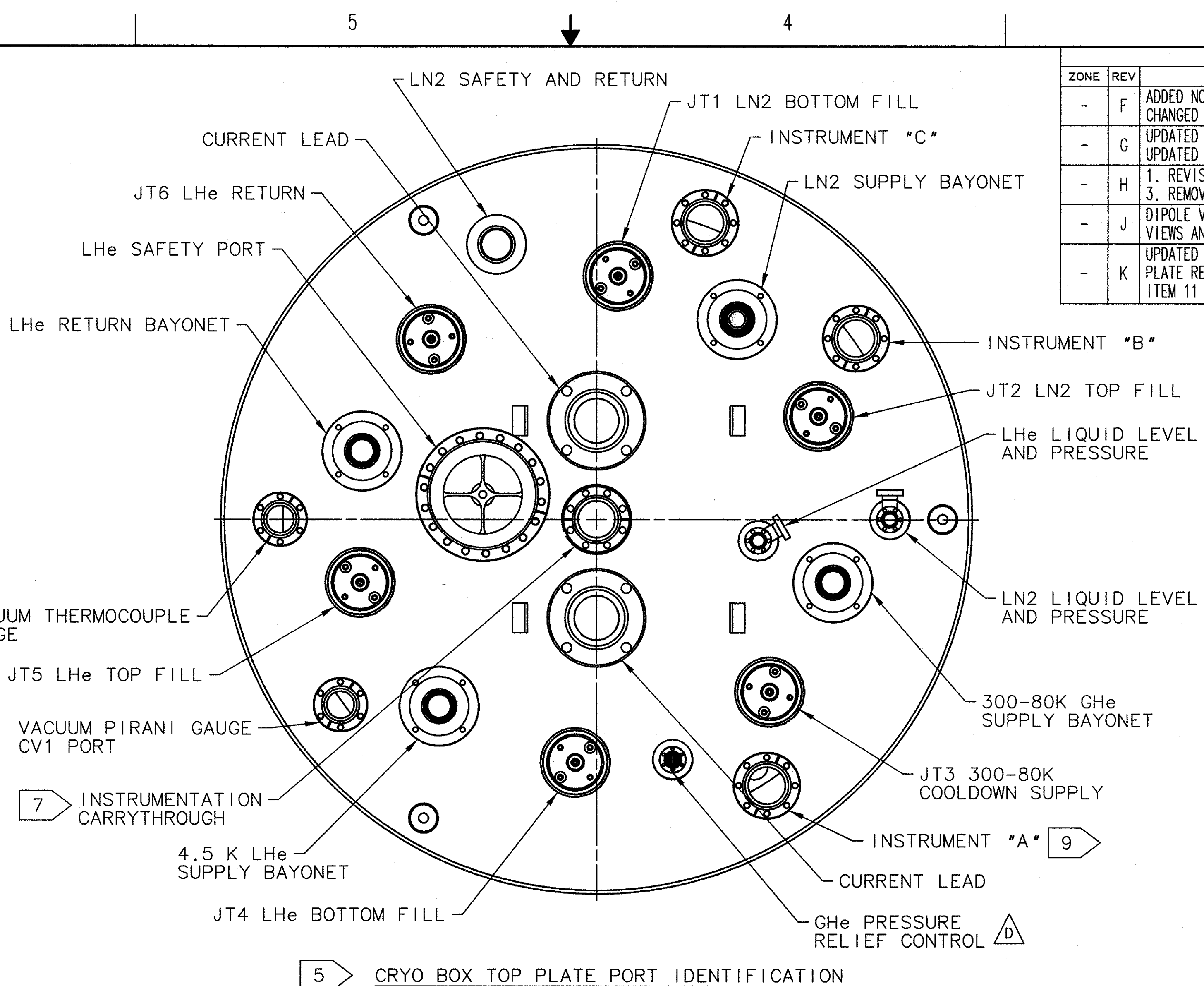
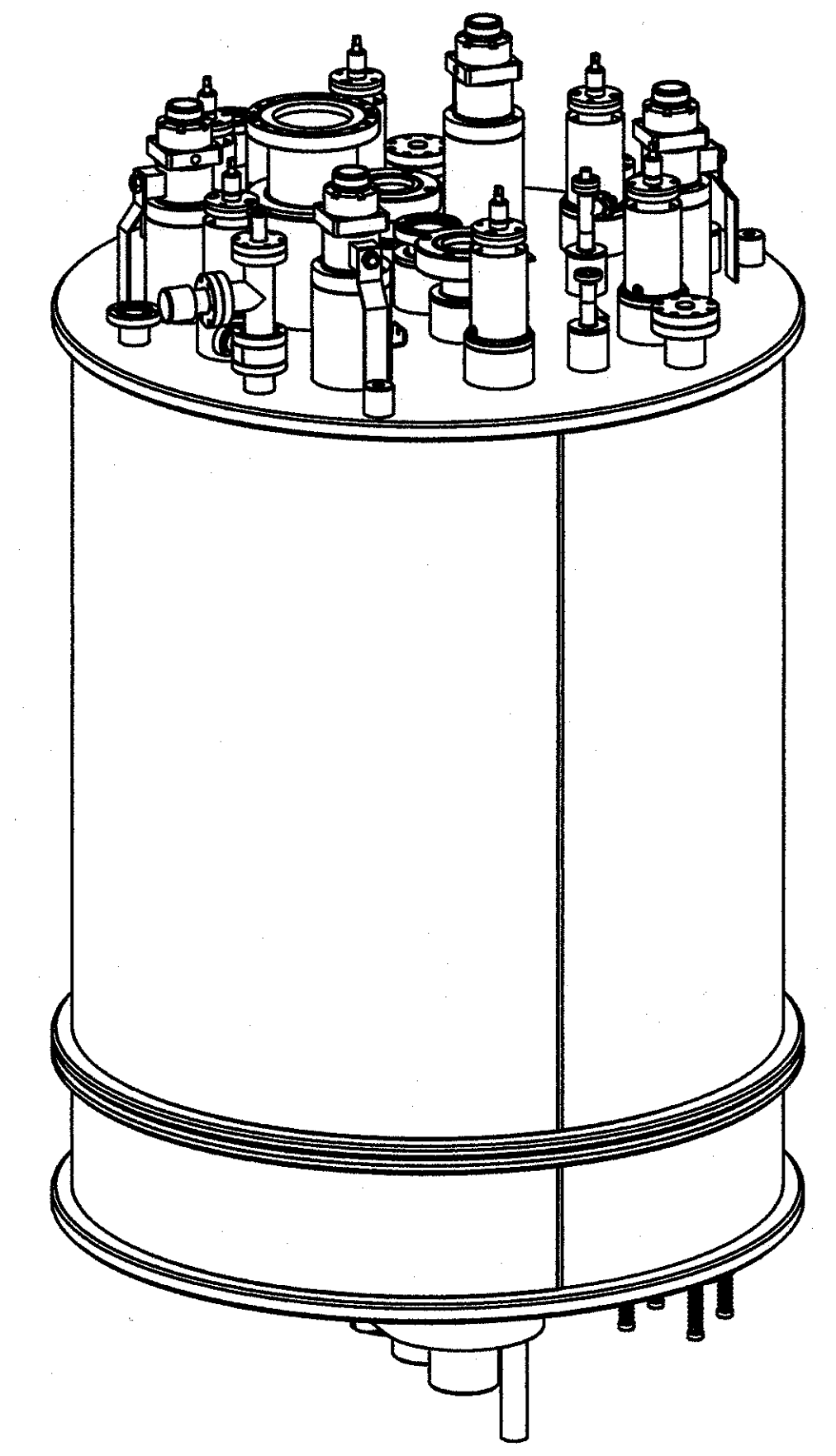
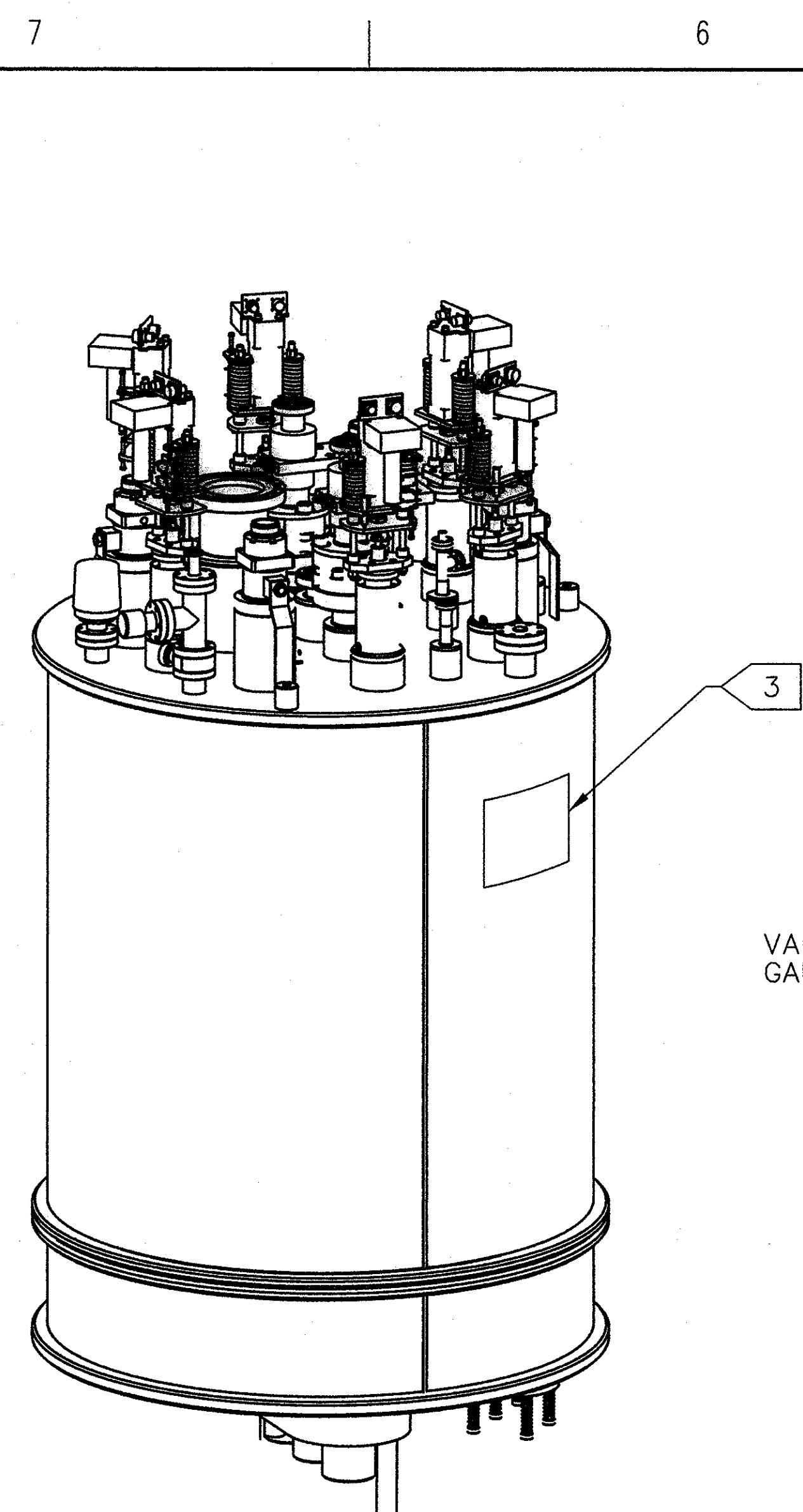


CRYO BOX ASSEMBLY



CRYO BOX SHIPPING CONFIGURATION



GENERAL NOTES:

- ALL OPEN PORTS AND VESSEL OPENINGS ARE TO BE CAPPED OR SEALED TO PREVENT DIRT OR FOREIGN OBJECTS FROM ENTERING THE INTERIOR OF THE CRYO BOX ASSEMBLY.
- THE ITEM SHOWN IS FOR ILLUSTRATION ONLY AND IS JLAB SUPPLIED. THE ITEM SHALL NOT BE INCLUDED IN QUOTATION.
- MARK CRYO BOX ASSEMBLY WITH MANUFACTURERS LOGO AND INFORMATION SPECIFICATIONS PLATE.
- IDENTIFY CRYO BOX CONNECTIONS AND MARK IDENTIFICATION ON ITEM 2 (TOP PLATE WELDMENT) NEAR CORRESPONDING PORT.
- USE BEST PRACTICE WHEN SILVER SOLDERING (DO NOT USE FLUX CONTAINING CHLORIDES).
- INSTALL AND SECURE 4 TUBES WITH PULL CABLES FOR INSTRUMENTATION WIRES MINIMUM TUBE ID SIZE IS .38 AND THE SAME LENGTH AS CURRENT LEADS TO BE COLOR CODED OR LABELED BOTH ENDS.
- INSTALL AND SECURE 1 TUBE WITH PULL CABLES FOR INSTRUMENTATION WIRES MINIMUM TUBE ID SIZE IS .38 AND THE SAME LENGTH AS CURRENT LEADS TO BE COLOR CODED OR LABELED BOTH ENDS.
- JLAB TO INSTALL METALLIC TAGS TO IDENTIFY JT VALVES AS DRAWN.

REQUIREMENT NOTES:

- ALL WELDING SHALL HAVE QUALIFIED WELDING PROCEDURE SPECIFICATIONS (WPSs), PROCEDURE QUALIFICATION RECORDS (PQRs), AND WELDER PERFORMANCE QUALIFICATION (WPQs) FOR WELDERS. ALL WPSs, PQRs, AND WPQs SHALL BE PROVIDED TO JEFFERSON LAB FOR REVIEW, AND BE QUALIFIED TO THE ASME 2007 SECTION IX IN THE PERFORMANCE OF THIS WORK. ALL INSPECTIONS SHALL BE DONE BY PERSONNEL QUALIFIED IN ACCORDANCE TO THE LATEST EDITION OF THE RECOMMENDED PRACTICES OF ASNT-TC-1A.
- THE APPLICABLE CODE FOR THE PIPING SHALL BE ASME B31.3-2006 FOR MATERIAL REQUIREMENTS, MATERIAL CERTIFICATIONS AND TRACEABILITY, FABRICATION, EXAMINATION, INSPECTION, PRESSURE TESTING, AND DOCUMENTATION EXCEPT FOR IMPACT TESTS. THE IMPACT TESTS FOR THE PIPING SHALL BE PERFORMED PER ASME 2007 SECTION VIII, DIVISION 2, SUBSECTION 3.11.4.1. THE WELDING PROCEDURE SPECIFICATION (WPS) FOR THE PIPING SHALL BE QUALIFIED TO ASME 2007 SECTION VIII, DIVISION 2, SUBSECTION 3.11.4.1. WELD FILLER METAL SHALL BE TYPE 316L. EACH HEAT OF FILLER METAL USED IN PRODUCTION SHALL HAVE A FERRITE NUMBER NOT GREATER THAN 5.
- THE APPLICABLE CODE FOR THE HELIUM RESERVOIR AND THE NITROGEN RESERVOIR SHALL BE ASME 2007 SECTION VIII, DIVISION 2 FOR MATERIAL REQUIREMENTS, MATERIAL CERTIFICATIONS AND TRACEABILITY, FABRICATION, EXAMINATION, INSPECTION, PRESSURE TESTING, AND DOCUMENTATION. THE EXAMINATION GROUP IS 3b, AS DEFINED IN ASME 2007 SECTION VIII, DIVISION 2, TABLE 7.1 AND TABLE 7.2. THE IMPACT TESTS FOR THE HELIUM RESERVOIR SHALL BE PERFORMED PER ASME 2007 SECTION VIII, DIVISION 2, SUBSECTION 3.11.4.1. THE WELDING PROCEDURE SPECIFICATION (WPS) FOR THE HELIUM RESERVOIR AND THE NITROGEN RESERVOIR SHALL BE QUALIFIED TO ASME 2007 SECTION VIII, DIVISION 2, SUBSECTION 3.11.4.1. WELD FILLER METAL SHALL BE TYPE 316L. EACH HEAT OF FILLER METAL USED IN PRODUCTION SHALL HAVE A FERRITE NUMBER NOT GREATER THAN 5.
- EXAMINATION PER ASME B31.3-2006 CATEGORY D REQUIREMENTS IS REQUIRED FOR THE WELDS OF THE OUTER VACUUM VESSEL. THE EXAMINATION RECORDS AND REPORTS PER ASME B31.3-2006 ARE REQUIRED.
- THE HELIUM RESERVOIR, NITROGEN RESERVOIR, OUTER VACUUM VESSEL, AND RELATED PIPING SHALL BE HELIUM MASS SPECTROMETER LEAK TESTED WITH A MINIMUM SENSITIVITY OF 1X10-9 ATM.-CC/SEC. THERE SHALL BE NO LEAKS DETECTABLE AT A MINIMUM SENSITIVITY OF 1X10-9 ATM.-CC/SEC. LEAK TIGHTNESS SHALL BE DEMONSTRATED BY RECORDING THE HELIUM MASS SPECTROMETER LEAK DETECTOR OUTPUT ON A CHART RECORDER FOR A MINIMUM OF ONE HOUR.
- THESE REQUIREMENT NOTES SHALL BE APPLICABLE TO ALL 67145 SHMS CRYO BOX ASSEMBLY DRAWINGS.
- THE PIPING IS DESIGNED PER ASME B31.3-2006, AND THE HELIUM RESERVOIR AND THE NITROGEN RESERVOIR ARE DESIGNED PER ASME 2007 SECTION VIII, DIVISION 2.
- LN2 RESERVOIR ASSEMBLY SHALL HAVE 40 LAYERS OF SUPER INSULATION. LHe RESERVOIR ASSEMBLY SHALL HAVE 10-20 LAYERS OF SUPER INSULATION.

REVISION HISTORY				REVISION HISTORY			
ZONE	REV	DESCRIPTION	DATE	APPROVED	ZONE	REV	DESCRIPTION
-	F	ADDED NOTES 6 THRU 9 CHANGED ITEM 21 WAS 67145-D-00650	01/07/10	BCM	1-5C 4-4C 5-4B 2-3C	B	IN NOTE C, ADDED "THE EXAMINATION ...". ADDED ITEMS 12 & 28. ADDITIONAL CALLOUT FOR ITEM 19.
-	G	UPDATED SECTION X-X, ADDED PART NUMBERS UPDATED QTY'S IN PARTS LIST	01/14/10	BCM			7/21/09 M.Fowler
-	H	1. REVISED JT NUMBERS. 2. ADDED NOTE 10. 3. REMOVED NOTE 8.	08/02/10	BCM			10/08/09 SUN ERIC
-	J	DIPLOLE VENT TUBE REMOVED VIEWS AND NOTES UPDATED	08/13/10	BCM			12/16/09 BCM
-	K	UPDATED VIEWS TO SHOW ADDITIONAL PARALLEL PLATE RELIEF VALVE. CORRECTED IN BCM, ITEM 11 DWG NUMBER (WAS 67145-00700)	12/03/10	GDV			12/17/09 BCM

QTY	ITEM NO.	PART OR IDENTIFYING NO.	DESCRIPTION	REVISION	DATE	BY	CHKD	APP'D	NOTES
1	50	#401021	CF HALF NIPPLE 1.33 OD						MDC VACUUM PRODUCTS OR EQUIVALENT
16	49	.3125-18UNC X 3.50 L	HEX HEAD BOLT						STAINLESS STEEL
1	48	HUNTINGTON MECH LAB #GA-675-1 OR EQUIV	GASKET, CF FLANGE 6.75 OD						ALUMINUM
1	47	HUNTINGTON MECH LAB #GA-337-1 OR EQUIV	GASKET, CF FLANGE 3.38 OD						ALUMINUM
1	46	HUNTINGTON MECH LAB #GA-275-1 OR EQUIV	GASKET, CF FLANGE 2.75 OD						ALUMINUM
18	45	.3125-18UNC X 2.25 L	HEX HEAD BOLT						304 SS ASTM SA-320, GR B8, CL 2
1	44	#110027	CF FLANGE BLANK 6.75 OD						MDC VACUUM PRODUCTS OR EQUIVALENT
1	43	#110015	CF FLANGE BLANK 3.38 OD						MDC VACUUM PRODUCTS OR EQUIVALENT
2	42	#110008	CF FLANGE BLANK 2.75 OD						MDC VACUUM PRODUCTS OR EQUIVALENT
3	41	#110000	CF FLANGE BLANK 1.33 OD						MDC VACUUM PRODUCTS OR EQUIVALENT
50	40	.3125-18 UNC	NUT, HEAVY HEX						304 SS ASTM SA-194, GR 8
3	39	#191007	COPPER GASKET						MDC VACUUM PRODUCTS OR EQUIVALENT
100	38	φ.3125 STANDARD	FLAT WASHER						STAINLESS STEEL
32	37	.3125-18UNC X 1.75 L	HEX HEAD BOLT						304 SS ASTM SA-320, GR B8, CL 2
5	36	HUNTINGTON MECH LAB #GA-133-1 OR EQUIV	GASKET, CF FLANGE 1.33 OD						ALUMINUM
12	35	#8-32 UNC	NUT, HEAVY HEX						304 SS ASTM SA-194, GR 8
24	34	#8 STANDARD	FLAT WASHER						STAINLESS STEEL
12	33	#8-32 UNC X .75 L	HEX HEAD BOLT						304 SS ASTM SA-320, GR B8, CL2
1	32	#191004	COPPER GASKET						MDC VACUUM PRODUCTS OR EQUIVALENT
12	31	.250-20 UNC	NUT, HEAVY HEX						304 SS ASTM SA-194, GR 8
24	30	φ.250 STANDARD	FLAT WASHER						STAINLESS STEEL
12	29	.250-20 UNC x 1.50 L	HEX HEAD BOLT						304 SS ASTM SA-320, GR B8, CL 2
-	28	LENGTH AS NECESSARY FROM STOCK	O-RING, .276 CS GLUE ENDS TO CREATE 35.83 ID						VITON
2	27	67145-00139	CURRENT LEAD BLANK						-
3	26	1FDRG417013A	41 PIN FEED THROUGH						KURT LESKER CO. OR EQUIVALENT
2	25	67145-00410	5000A VAPOR COOLED CURRENT LEAD ASSY						JLAB FURNISHED
1	24	AMI-X-DN40CF	EDWARDS MAGNETROM GAUGE						JLAB SUPPLIED
1	23	67145-00327-01	LHe LEVEL PROBE						JLAB SUPPLIED
1	22	67145-00327-02	LN2 LEVEL PROBE						JLAB SUPPLIED
6	21	000000-04-02-1019	ELECTRIC VALVE ACTUATOR ASSY						-
1	20	#401002	CF HALF NIPPLE 2.75 OD						MDC VACUUM PRODUCTS OR EQUIVALENT
2	19	67145-00400	TEE FITTING ASSEMBLY						-
1	18	67145-00140	CF FLANGE 6.75 OD (MODIFIED)						-
1	17	110017	CF FLANGE 3.375 OD						MDC VACUUM PRODUCTS OR EQUIVALENT
2	16	67145-00305	LHe VCL INTERCONNECT FLANGE						-
4	15	67145-E-00630	1 1/2 FEMALE BAYONET ASSEMBLY						-
6	14	67145-E-00600	CONTROL VALVE ASSY (JT)						-
1	13	67145-00324	VACUUM PORT ASSEMBLY						-
2	12	PARKER #2-233	O-RING, 2.859 ID X .139 CS						VITON
1	11	67145-00405	CRYO BOX BOTTOM PLATE WELDMENT						-
1	10	67145-00404	LN2 CRYO INTERCEPT SHIELD RING						-
1	9	67145-00403	LN2 CRYO INTERCEPT SHIELD PLATE						-
1	8	67145-00300	LHe RESERVOIR ASSEMBLY						-
1	7	67145-00200	LN2 RESERVOIR ASSEMBLY						-
1	6	67145-00131	CRYO BOX VESSEL CLAMHELL RING						-
1	5	67145-00130	CRYO BOX VESSEL CLAMHELL RING WITH GROOVE						-
2	4	67145-00129	CRYO BOX VESSEL CLAMHELL SHORT						-
2	3	67145-00107	CRYO BOX VESSEL CLAMHELL						-
1	2	67145-00100	CRYO BOX TOP PLATE WELDMENT						-
1	1	67145-01000	SHMS CRYO BOX ASSEMBLY						-

DOCUMENT CONTROL STAMP		TRACKING NO.		United States Department of Energy	
MATERIAL: SEE PARTS LIST		APPROVALS: DATE		Jefferson Lab Office of Jefferson National Accelerator Facility Newport News, Virginia	
THIRD ANGLE PROJECTION		CHECKED: DATE		HALL C 12 GEV UPGRADE MAGNETS SHMS CRYO BOX ASSEMBLY	
DO NOT SCALE DRAWING		APPROVED: DATE		REV. K	
		SCALE: 1" = 1"		67145-01000	