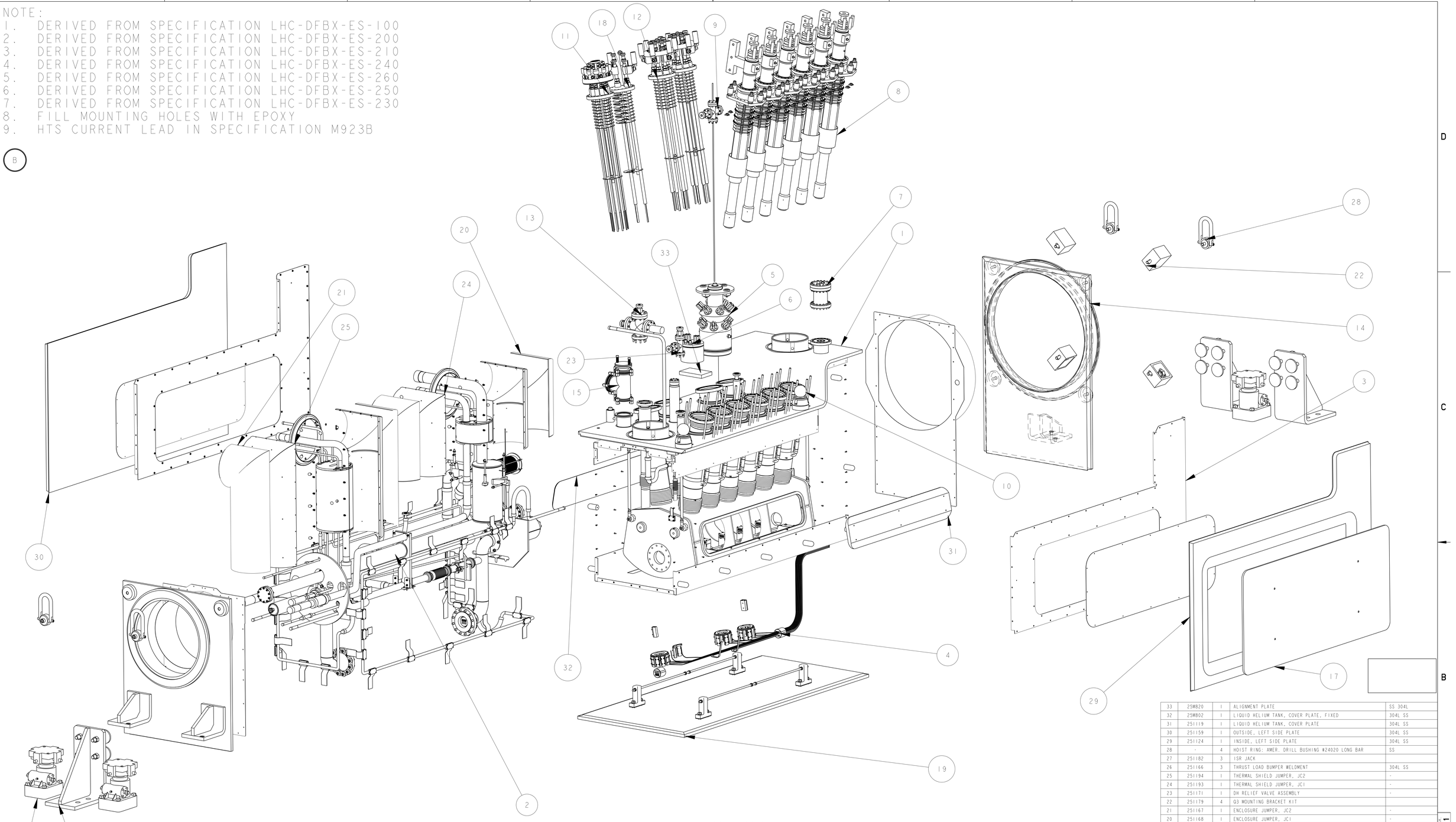
NOTE:
1. DERIVED FROM SPECIFICATION LHC-DFBX-ES-100
2. DERIVED FROM SPECIFICATION LHC-DFBX-ES-200
3. DERIVED FROM SPECIFICATION LHC-DFBX-ES-210
4. DERIVED FROM SPECIFICATION LHC-DFBX-ES-240
5. DERIVED FROM SPECIFICATION LHC-DFBX-ES-260
6. DERIVED FROM SPECIFICATION LHC-DFBX-ES-250
7. DERIVED FROM SPECIFICATION LHC-DFBX-ES-230
8. FILL MOUNTING HOLES WITH EPOXY
9. HTS CURRENT LEAD IN SPECIFICATION M923B

B



SCALE 1/10

ITEM	PART NO	REQD	DESCRIPTION	MATERIAL
33	25M820	1	ALIGNMENT PLATE	SS 304L
32	25M802	1	LIQUID HELIUM TANK, COVER PLATE, FIXED	304L SS
31	251119	1	LIQUID HELIUM TANK, COVER PLATE	304L SS
30	251159	1	OUTSIDE, LEFT SIDE PLATE	304L SS
29	251124	1	INSIDE, LEFT SIDE PLATE	304L SS
28	-	4	HOIST RING: AMER. DRILL BUSHING #24020 LONG BAR	SS
27	251182	3	ISR JACK	
26	251166	3	THRUST LOAD BUMPER WELDMENT	304L SS
25	251194	1	THERMAL SHIELD JUMPER, JC2	-
24	251193	1	THERMAL SHIELD JUMPER, JC1	-
23	251171	1	DH RELIEF VALVE ASSEMBLY	-
22	251179	4	Q3 MOUNTING BRACKET KIT	
21	251167	1	ENCLOSURE JUMPER, JC2	-
20	251168	1	ENCLOSURE JUMPER, JC1	-
19	251858	1	BASE PLATE ASSY	-
18	251164	1	600 AMP, 2-LEAD CLUSTER ASSEMBLY	-
17	251125	1	SIDE PLATE COVER	304L SS
16	251133	1	DI PLATE ASSY DFBXG	-
15	251910	1	ROUGHING PORT ASSEMBLY	-
14	251129	1	Q3 PLATE ASSY	-
13	251339	1	HELIUM PORT RELIEF VALVE ASSEMBLY	-
12	24C353	2	600 AMP,6 LEAD VAPOR COOLED ASSY	-
11	24C322	1	120 AMP VC LEAD MOUNTING ASSY	-
10	251868	2	TOOLING BALL, LHCQIMSA00092	-
9	251162	1	LHE DIAGNOSTIC ASSY	-
8	251156	6	PIRELLI HTS LEAD KIT	-
7	251851	1	HELIUM GUARD ASSEMBLY	-
6	251163	1	LBX DIAGNOSTIC ASSY	-
5	251831	1	LQX DIAGONSTIC ASSEMBLY	-
4	251864	1	BUS DUCT ASSEMBLY	-
3	251079	1	THERMAL SHIELD ASSY, DFBXG	-
2	251226	1	PIPING ASSEMBLY DFBXG, DFBXC	-
1	251137	1	DFBX C AND G	-

11. SOLDER JOINT USING SN60PB40 SOLDER; ROSIN FLUX, USE SPLICE PLATE IF REQUIRED
12. CLOSEOUT WELD PROCEDURE TO BE APPROVED BY LBNL
    DISTORTION CONTROL IS ESSENTIAL, ROOT PASS GTAW, COVER PASSES GMAW, SMAW, FCMAW.
13. WELD PROCEDURE TO BE APPROVED BY LBNL, USE GTAW PROCESS
14. BELLOWS TO BE WITHIN 0.03" OF FREE CONFIGURATION AFTER CLOSEOUT WELDING
15. DIMENSIONS FROM DFBX FLANGE FACE ON DI SIDE, ADD -2367.2 MM TO OBTAIN POSITION RELEATIVE TO DFBX COORDINATE SYSTEM
16. SHIM TANK SUPPORTS TO LIMIT STATIC DEFLECTION OF THE LOWER TANK SUPPORT RODS TO LESS THAN 0.25"
17. DIMENSIONS SHOW IN INSPECTION OVAL ARE REFERENCED IN THE FABRICATION TRAVELER
18. COPPER STRAP ATTACHED TO THE THERMAL ANCHORS DO NOT HAVE TO BE EVENLY SPACED.
19. ALL DIMENSIONS GIVEN AT ROOM TEMPERATURE

THIRD ANGLE PROJECTION

REV	DWG	CHK	ZONE	DATE	CHANGES
C	JDR	DPO		02/24/03	CHANGED PIPE END POSITIONS, CHANGED WELD ON SIDE PLATE COVER
B	JDR	DPO		12/09/02	REMOVED NOTE 10; BOM CORRECTIONS SHEET 4 TOL CHANGE FROM .03 TO .08 ADD DATUM FLAGS
A	JDR	DPO		10/03/02	INITIAL RELEASE

UNLESS OTHERWISE SPECIFIED
TOLERANCES
X.X ± 0.1 | FRAC. ± 1/64
X.XX ± 0.03 | Angles ± 1.00°
X.XXX ± 0.010 | FINISH 125 µin
DO NOT SCALE PRINT
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°
CUT ROUND, 1.5 THREAD RELIEF ON MACHINED THREADS
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS, WELD SPATTER & LOOSE SCALE
IN ACCORDANCE WITH ASME Y14.5M & BAL1

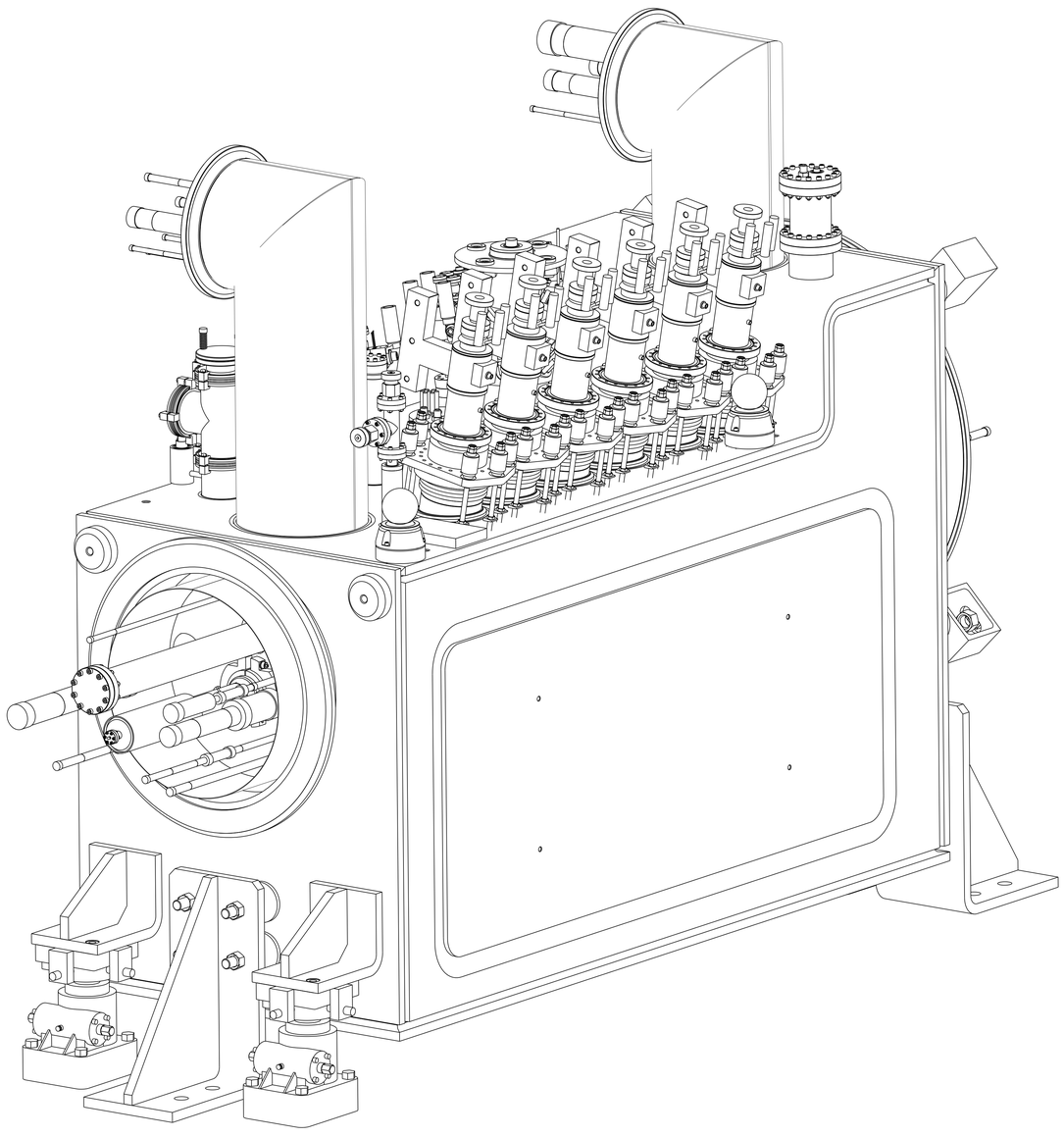
SHOP ORDERS
ACC NO. -
REQD NO. -
DEL TO -
DATE REQD -
SURFACE TREATMT. -
IDENT METHOD TAG
PROJECT NUMBER -
PROJECT NAME N/A
DWG BY M J KNOLLS DATE 02-Nov-01
CHK BY Jon Zbasnik DATE 03-OCT-02
APR BY Jon Zbasnik DATE 03-OCT-02

ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA - BERKELEY

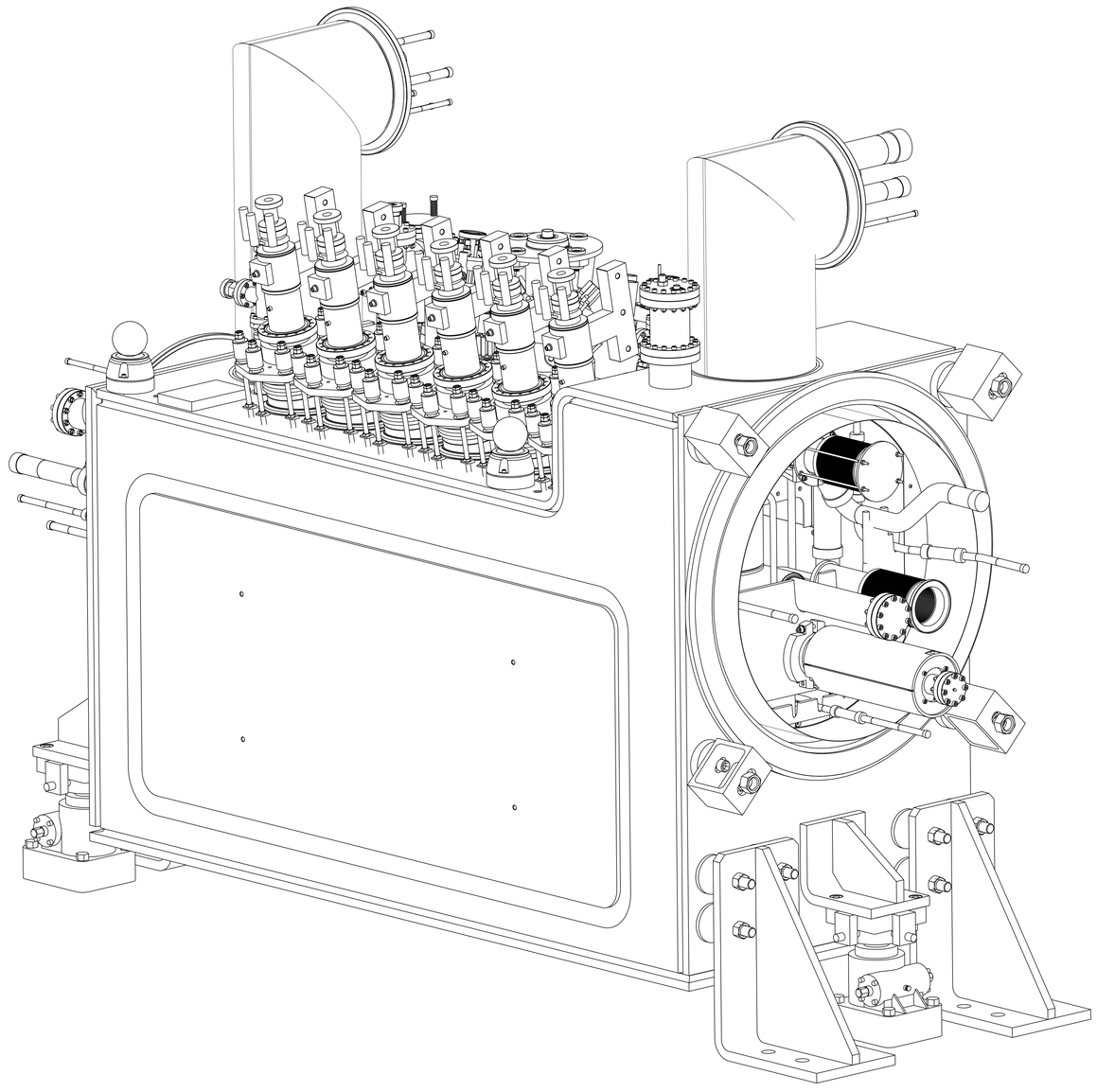
LHC IR FEEDBOX
MAJOR ASSEMBLY
DFBXC&G (IP2&8, LEFT) FEED BOX ASSY

MICROFILMED: | PATENT CLEAR:
DWG. TYPE: ASSEM | SHOWN ON: - | SCALE: 1:3/100 | DO NOT SCALE PRINTS
SHEET 1 OF 11
DESIGN ACCT. NO. Z5LCE2 | CATEGORY CODE LH2001 | DWG. NO. 24C3526 | SIZE C | REV.

DWG. NO. 24C3526 SH. 1 REV. C



D1 END



Q3 END

DFBXC, IP2 (LEFT)
DFBXG, IP8 (LEFT)

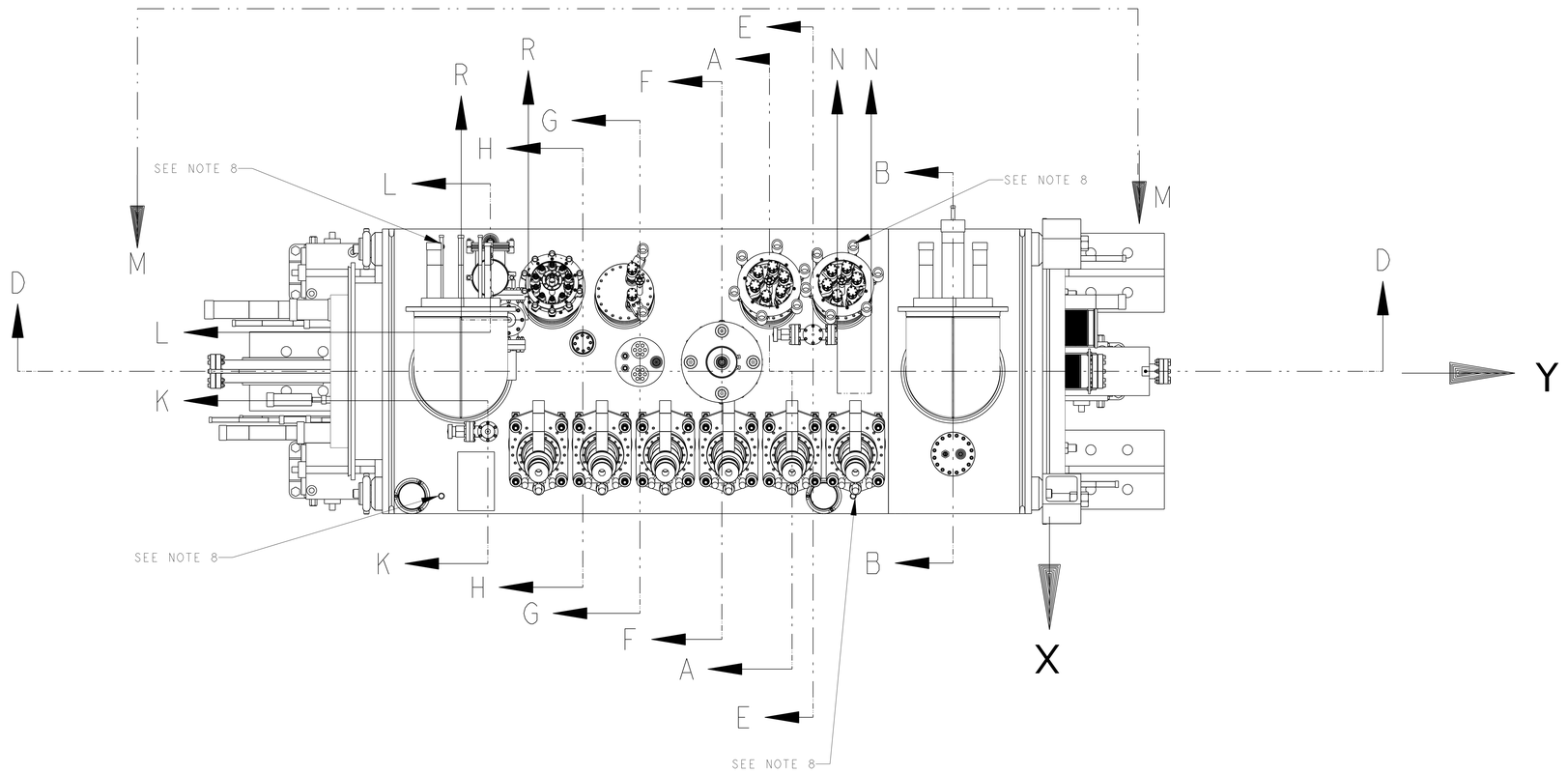
THIRD ANGLE PROJECTION

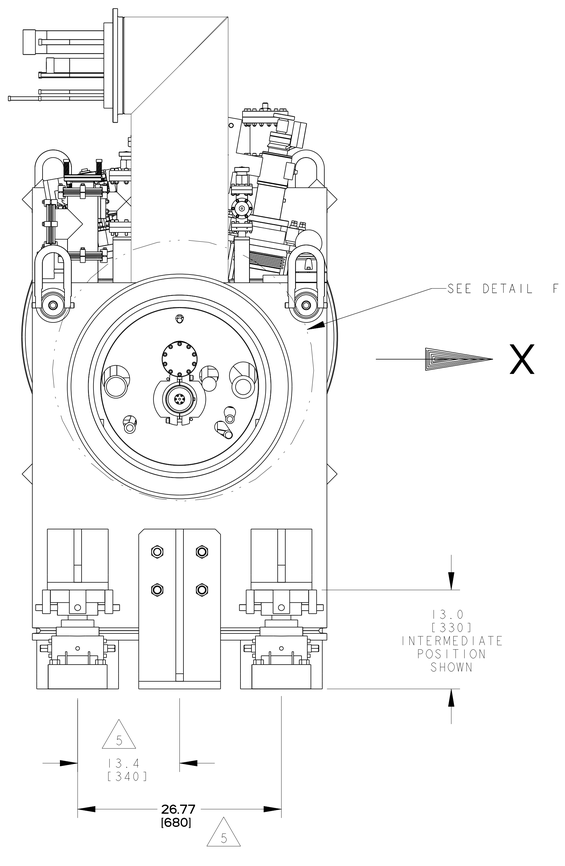
ERNEST ORLANDO LAWRENCE
BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA - BERKELEY

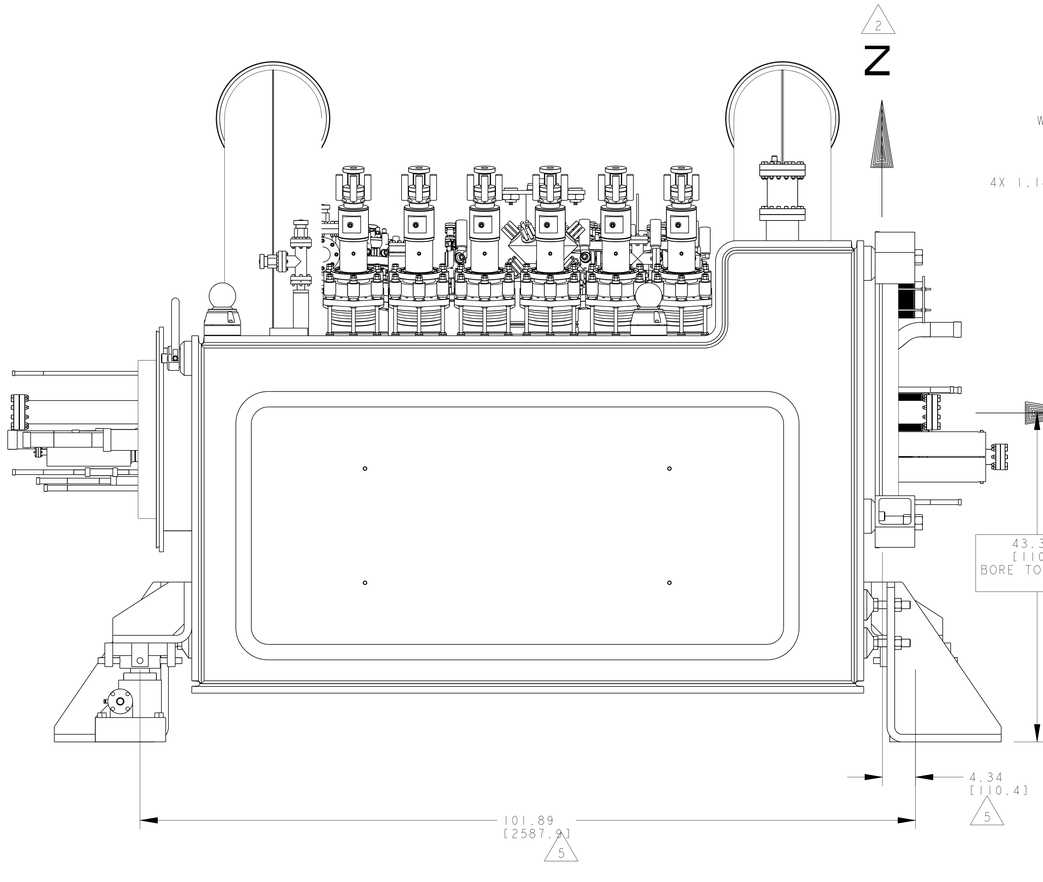
LHC IR FEEDBOX
MAJOR ASSEMBLY
DFBXC&G (IP2&8, LEFT) FEED BOX ASSY

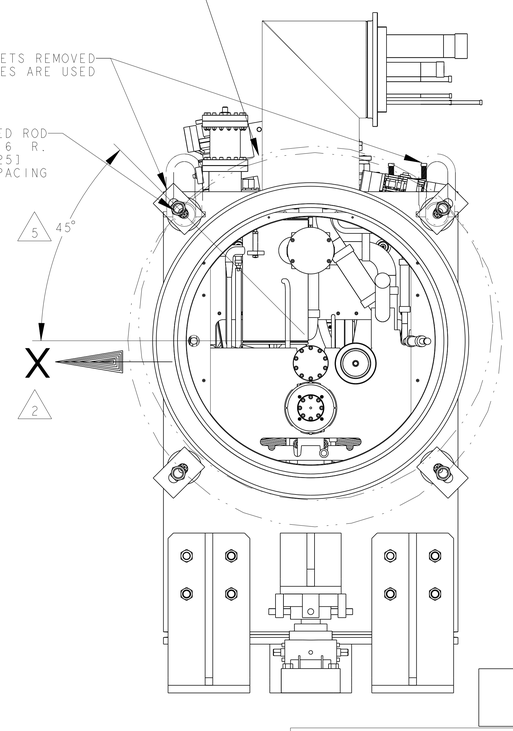
MICROFILMED:	DWG. TYPE	SHOWN ON	SCALE: 9/50	DO NOT SCALE PRINTS
	ASSEM	-	SHEET 2 OF 11	
PATENT CLEAR:	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	Z5LCE2	LH2001	24C3526	C

DWG. NO. 24C3526 SIZE C REV 2









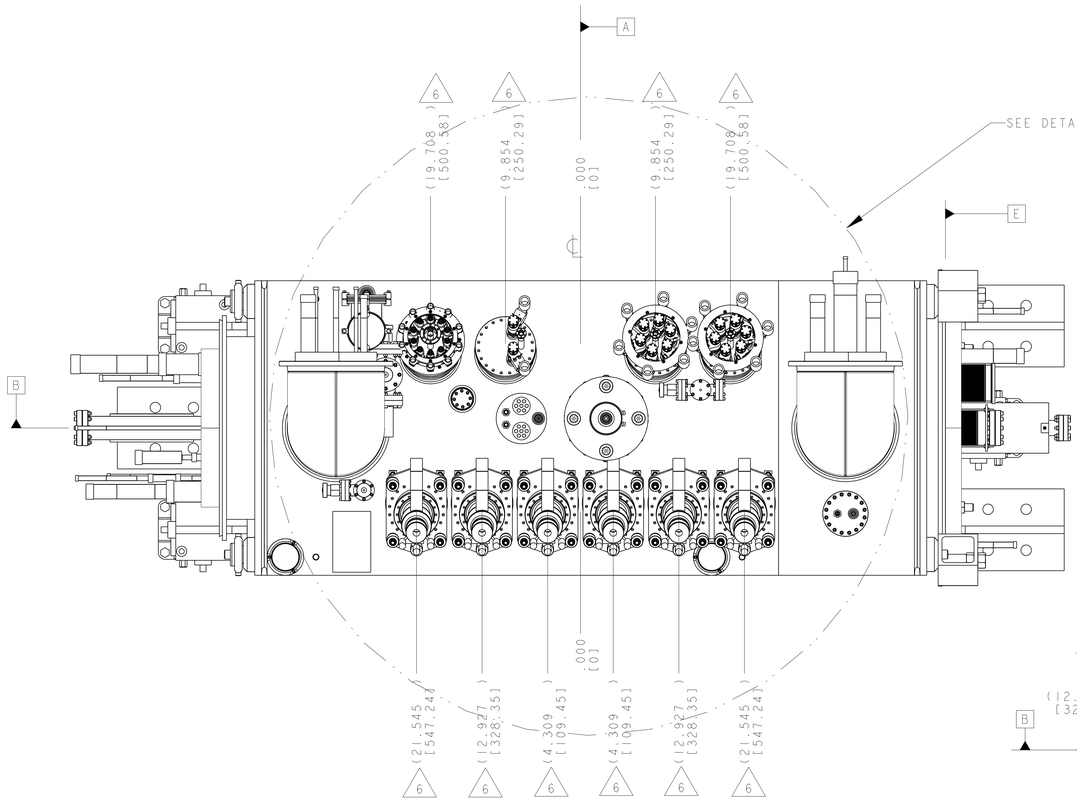
THIRD ANGLE PROJECTION

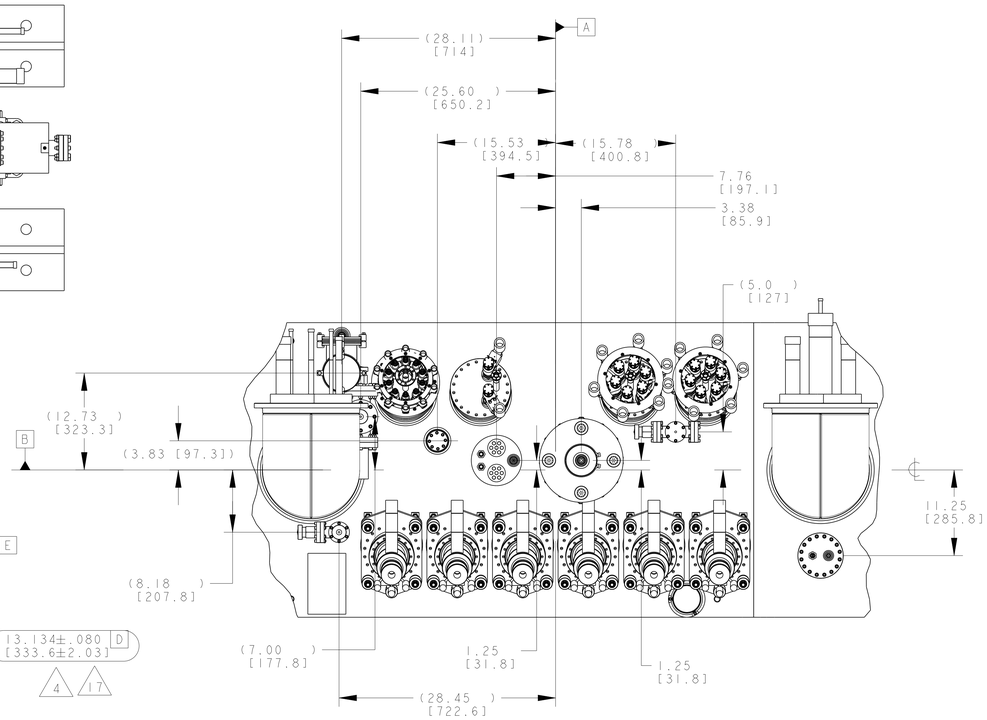
ERNEST ORLANDO LAWRENCE
BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA - BERKELEY

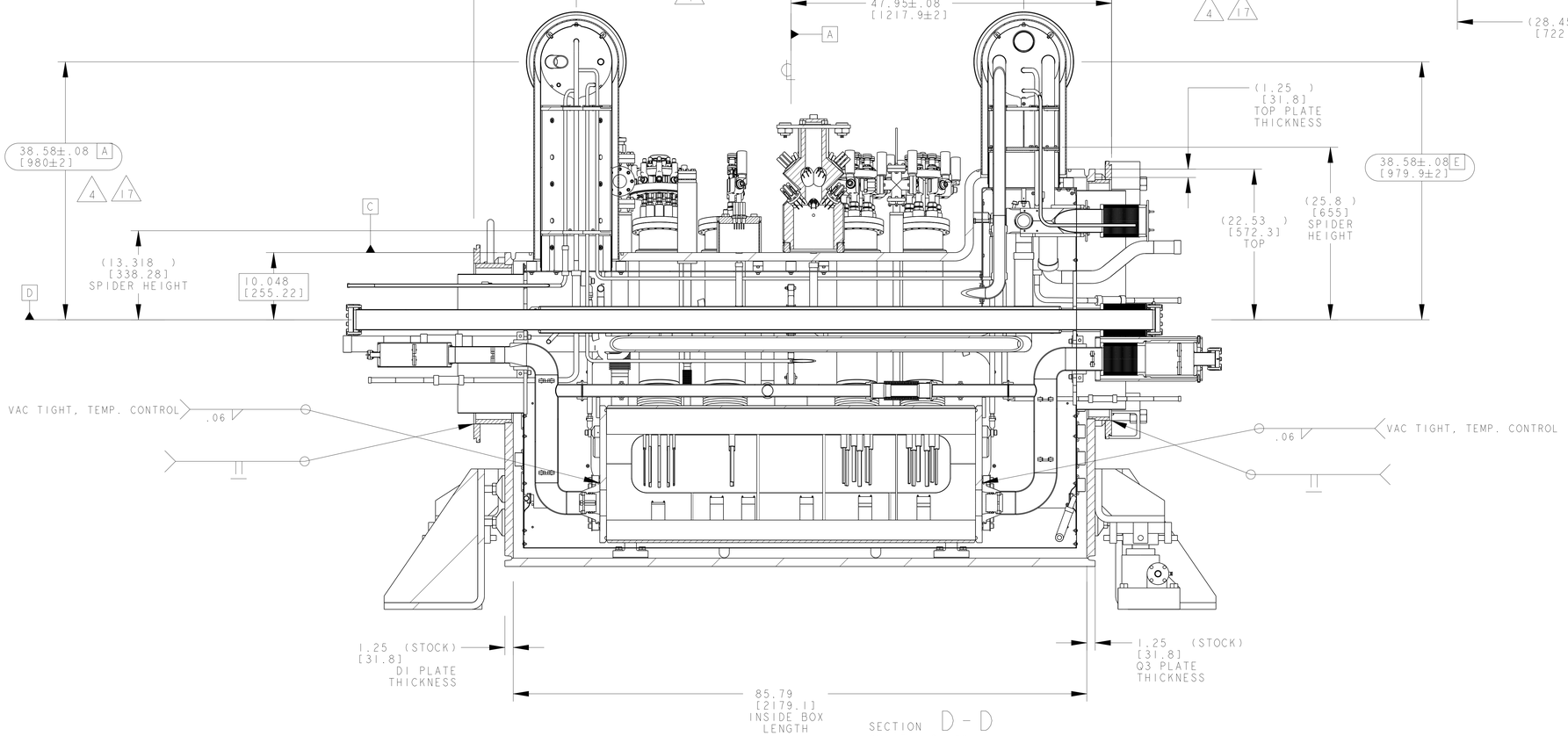
LHC IR FEEDBOX
MAJOR ASSEMBLY
DFBXC&G (IP2&8, LEFT) FEED BOX ASSY

MICROFILMED:	DWG. TYPE	SHOWN ON	SCALE: 1:7/100	DO NOT SCALE PRINTS
	ASSEM	-	SHEET 3 OF 11	
PATENT CLEAR:	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	Z5LCE2	LH2001	24C3526	C

DWG. NO. 24C3526 SHEET NO. 3 C







SECTION D - D
SCALE 13/100

DETAIL G
SCALE 13/100

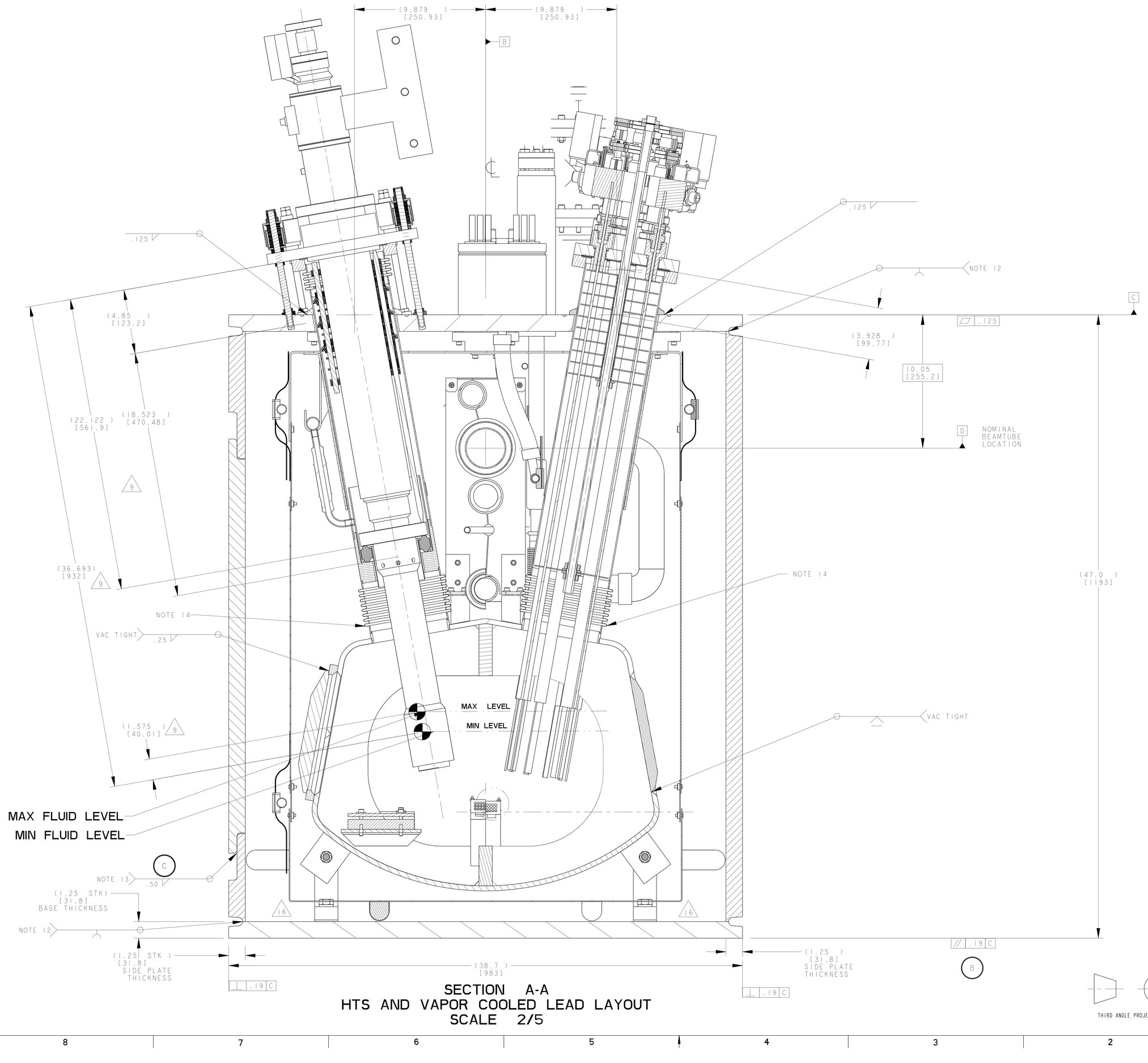
THIRD ANGLE PROJECTION

ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA - BERKELEY

LHC IR FEEDBOX
MAJOR ASSEMBLY
DFBXC&G (IP2&8, LEFT) FEED BOX ASSY

MICROFILMED:	DWG. TYPE	SHOWN ON	SCALE: 13/100	DO NOT SCALE PRINTS
	ASSEM	-	SHEET 4 OF 11	
PATENT CLEAR:	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	Z5LCE2	LH2001	24C3526	C

DWG. NO. 24C3526 SIZE C REV 4



SECTION A-A
HTS AND VAPOR COOLED LEAD LAYOUT
SCALE 2/5

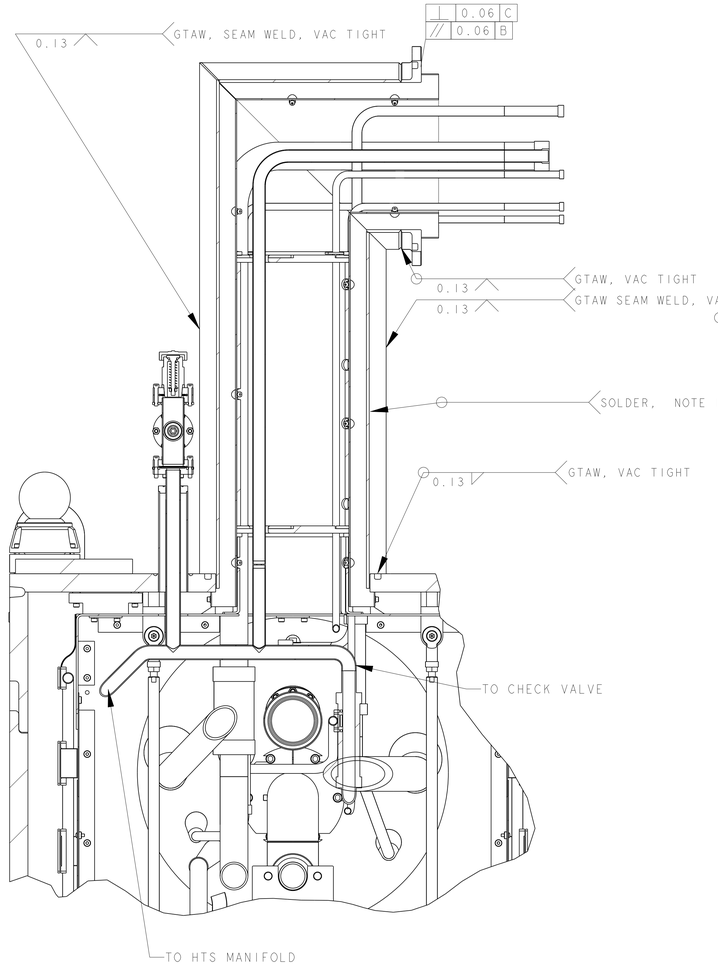
THIRD ANGLE PROJECTION

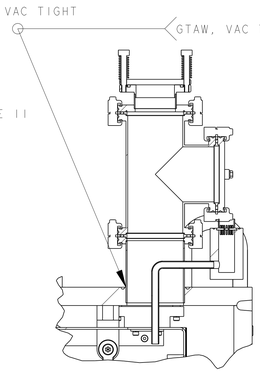
ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA - BERKELEY

LHC IR FEEDBOX
MAJOR ASSEMBLY
DFBXC FEED BOX ASSY SKEL

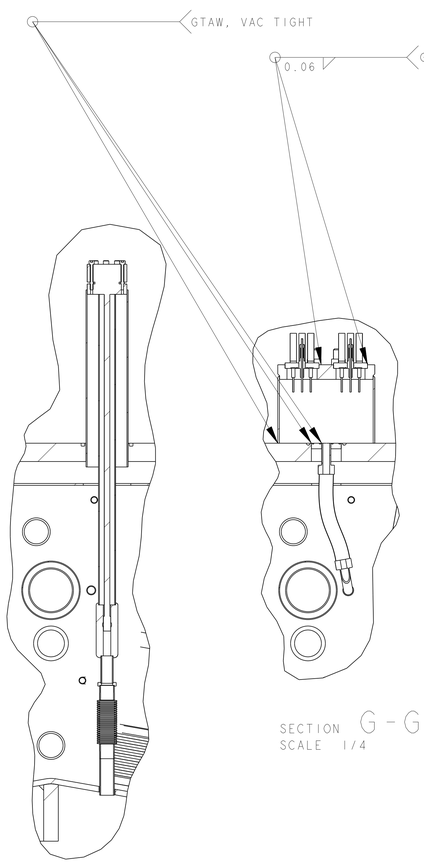
MICROFILMED:	DWG. TYPE	SHOWN ON	SCALE: 3/50	DO NOT SCALE PRINTS
	PART	-	SHEET 5 OF 11	
PATENT CLEAR:	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	Z5LCE2	LH2001	24C3526	B

DWG. NO. 24C3526 SHEET REV. B 5

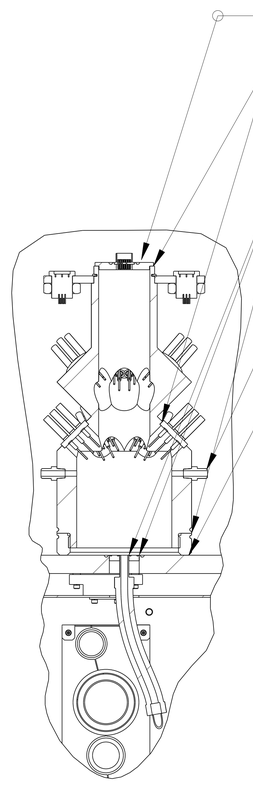




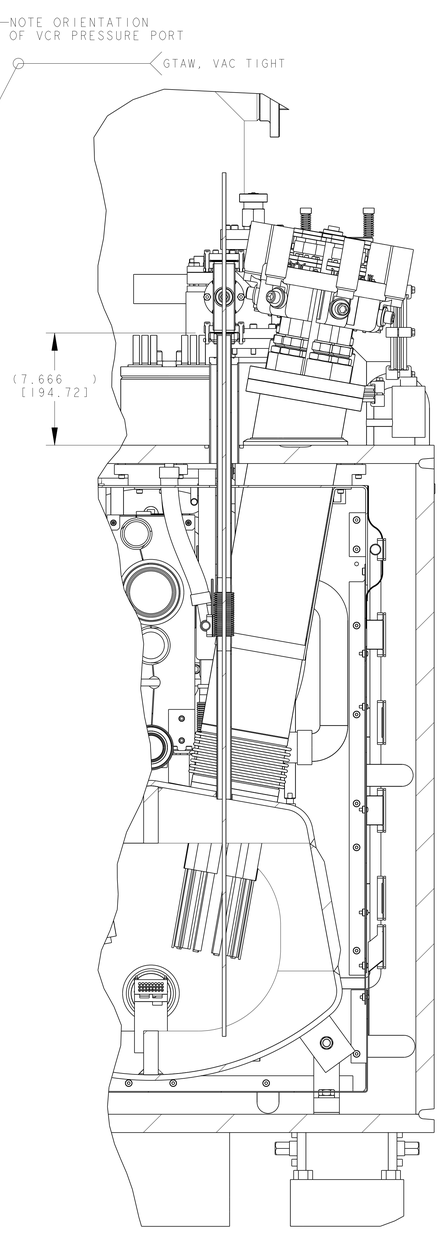
SECTION L - L
SCALE 1/4



SECTION G - G
SCALE 1/4

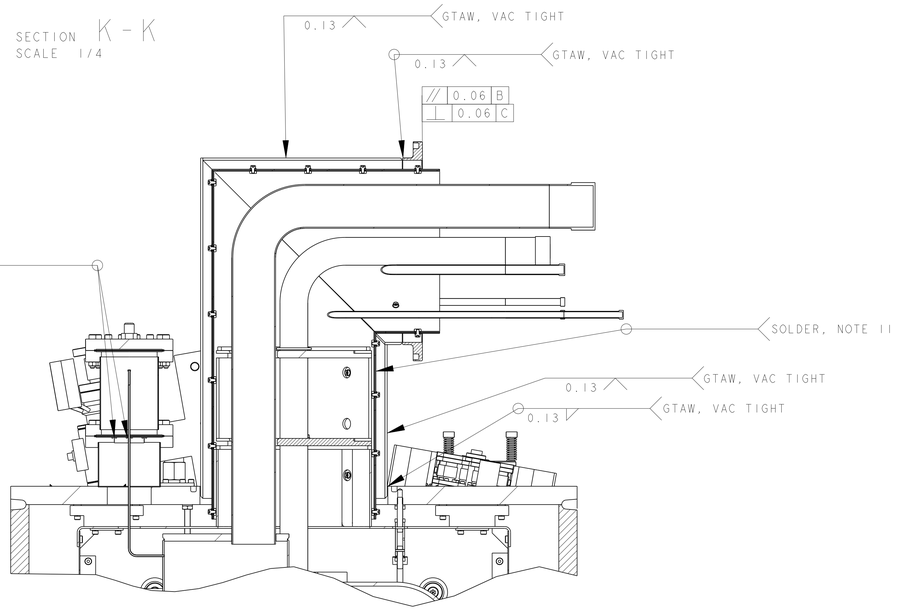


SECTION F - F
SCALE 1/4



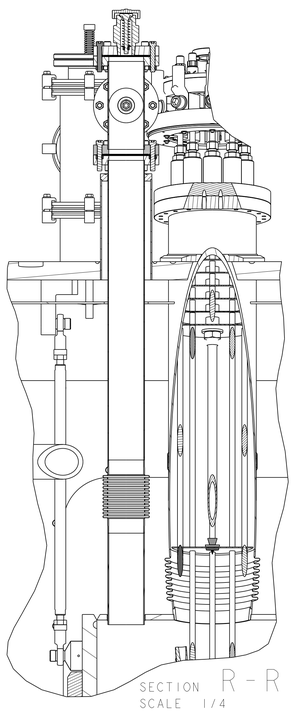
SECTION E - E
SCALE 1/4

SECTION H - H
SCALE 1/4

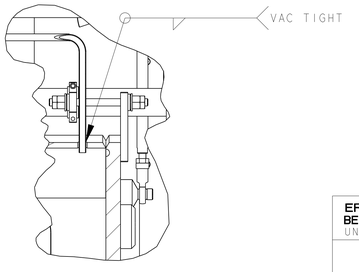


SECTION K - K
SCALE 1/4

SECTION B - B
SCALE 1/4



SECTION R - R
SCALE 1/4



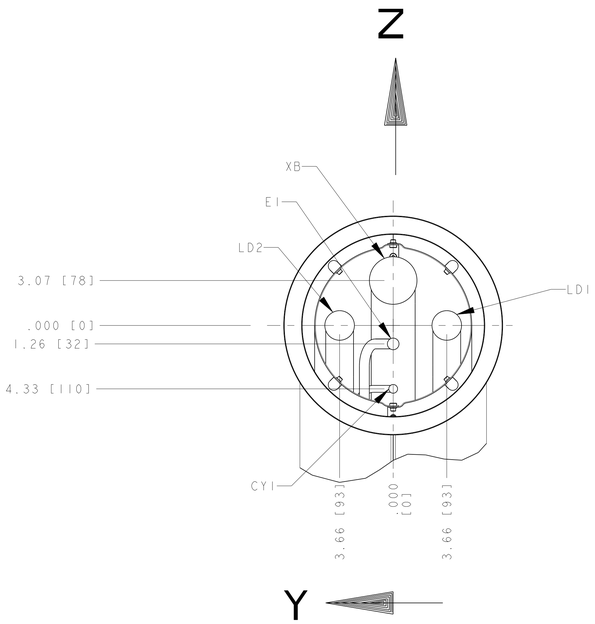
SECTION N - N
SCALE 1/4

ERNEST ORLANDO LAWRENCE
BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA - BERKELEY

LHC IR FEEDBOX
MAJOR ASSEMBLY
DFBXC&G (IP2&8, LEFT) FEED BOX ASSY

MICROFILMED:	DWG. TYPE: ASSEM	SHOWN ON: -	SCALE: 1/100	DO NOT SCALE PRINTS
			SHEET 6 OF 11	
PATENT CLEAR:	DESIGN ACCT. NO.: Z5LCE2	CATEGORY CODE: LH2001	DWG. NO.: 24C3526	SIZE: C / REV.

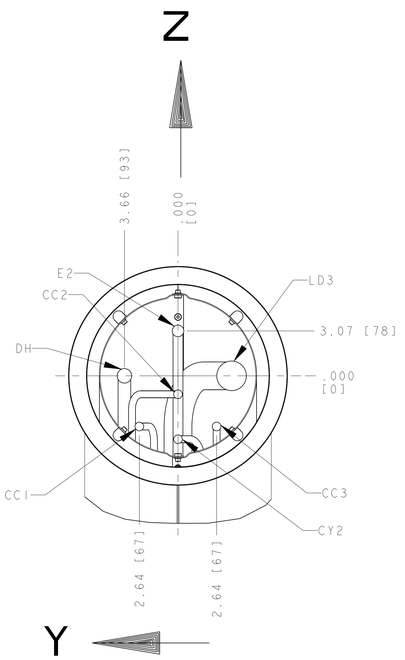
DWG. NO. 24C3526 SHEET NO. C 6



		DIM'S MEASURED FROM FLANGE CENTER	
PIPE	X	Y ±0.08	Z ±0.08
XB	-11.85±.08 [301±2]	0	3.07 [78]
LD2	-11.85±.08 [301±2]	3.66 [93]	0
LD1	-11.85±.08 [301±2]	-3.66 [93]	0
E1	-14.45±.08 [367±2]	0	-1.26 [32]
CY1	-14.45±.08 [367±2]	0	-4.33 [110]

4

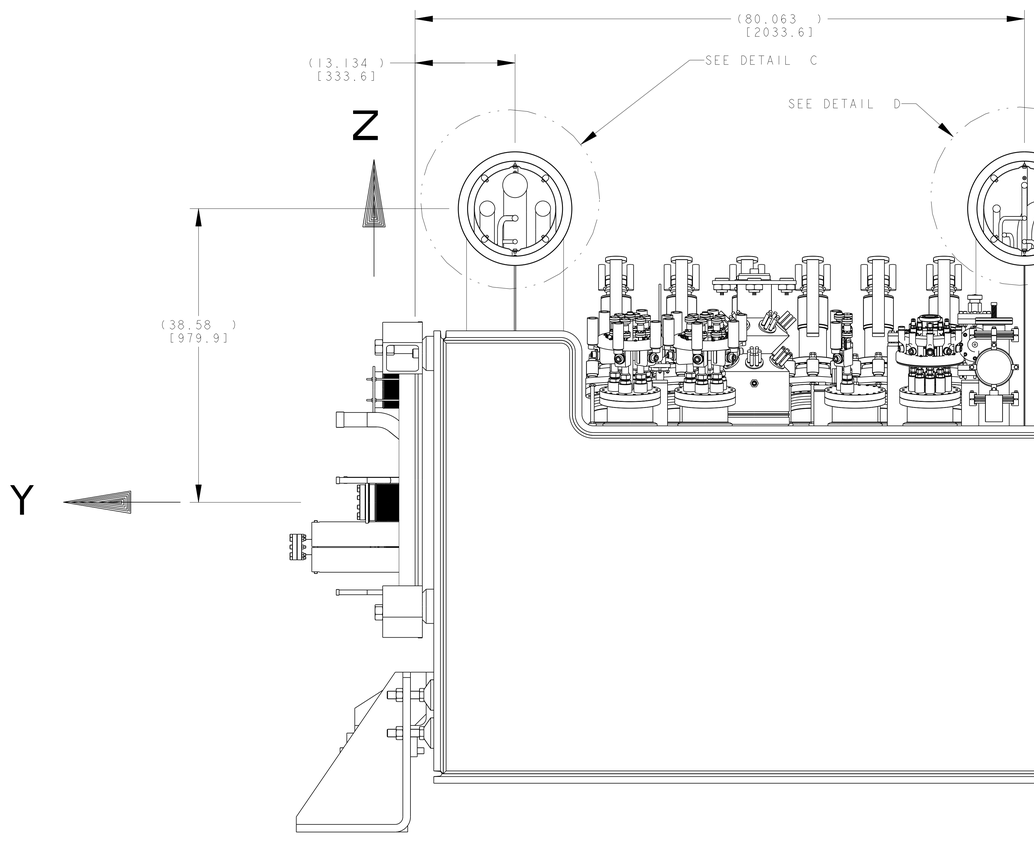
DETAIL C
JC1 / QQSC
DIMENSIONAL TOLERANCE ± 0.08
ORIENTATION OPPOSITE OF SPECIFICATION 240
SCALE 1/4



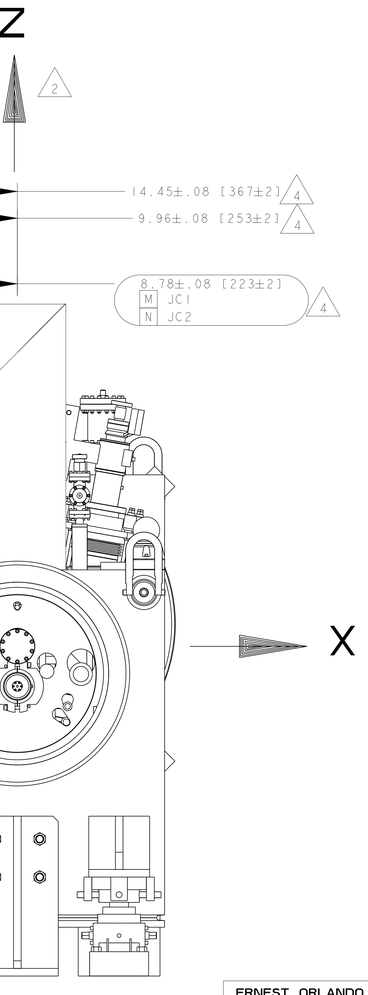
		DIM'S MEASURED FROM FLANGE CENTER	
PIPE	X	Y ±0.08	Z ±0.08
E2	-14.45±.08 [367±2]	0	3.07 [78]
DH	-14.45±.08 [367±2]	3.66 [93]	0
LD3	-11.85±.08 [301±2]	-3.66) [93]	0
CC2	-14.45±.08 [367±2]	0	-1.26 [32]
CC1	-14.45±.08 [367±2]	2.64 [67]	-3.46 [88]
CC3	-14.45±.08 [367±2]	-2.64 [67]	-3.46 [88]
CY2	-14.45±.08 [367±2]	0	-4.33 [110]

4

DETAIL D
JC2 / QQSD
DIMENSIONAL TOLERANCE ± 0.08
ORIENTATION OPPOSITE OF SPECIFICATION 240
SCALE 1/4



VIEW M - M
ROTATED 180°



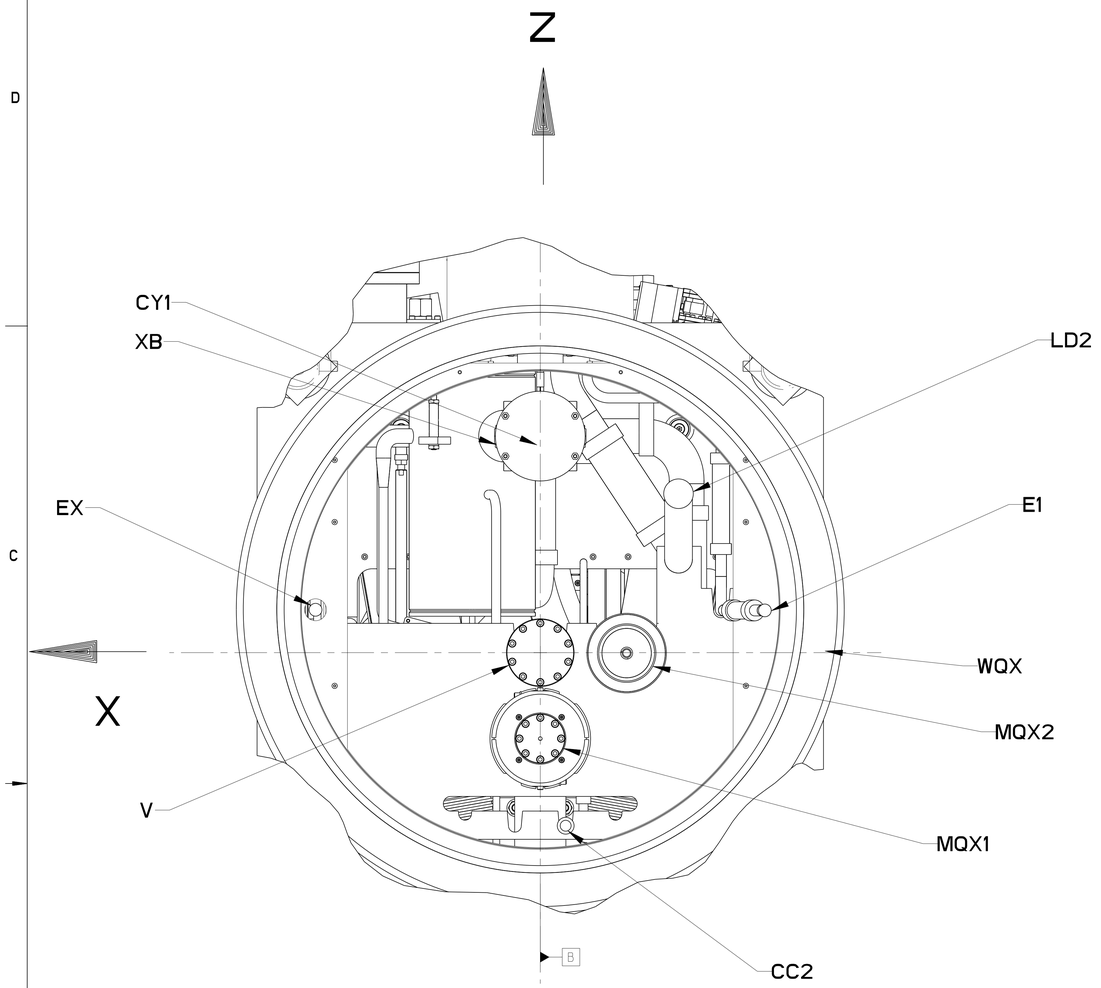
THIRD ANGLE PROJECTION

ERNEST ORLANDO LAWRENCE
BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA · BERKELEY

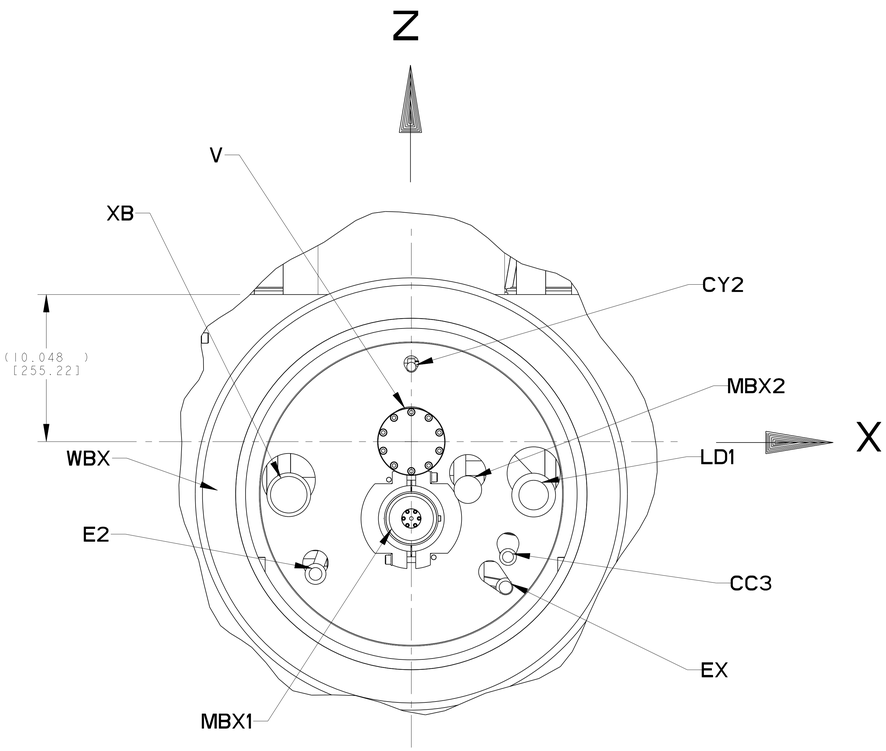
LHC IR FEEDBOX
MAJOR ASSEMBLY
DFBXC FEED BOX ASSY SKEL

MICROFILMED:	DWG. TYPE	SHOWN ON	SCALE: 3/50	DO NOT SCALE PRINTS
	PART	.	SHEET 7 OF 11	
PATENT CLEAR:	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	Z5LCE2	LH2001	24C3526	B

DWG. NO. 24C3526 SIZE B SHT 7



DETAIL E
SCALE 1/4



DETAIL F
SCALE 1/4

C

Q3 PIPING INTERFACE
PER SPEC. LHC-DFBX-ES-210.00 REV 1.0

DFBX	PIPE OD/ID		PIPE COORDINATES AT 300 K		
DFBX	OD in [mm]	ID in [mm]	X in [mm] ±.08	Z in [mm] ±.08	Y in [mm] ±.08
V	3.071 [78]	2.913 [73.99]	.000 [0]	.000 [0]	2.032 [51.61]
LD2	1.748 [44.4]	1.650 [41.91]	-9.444 [-239.88]	10.855 [275.72]	6.299 [159.99]
CC3	.626 [15.9]	.528 [13.41]	1.735 [44.07]	-11.822 [-300.28]	6.299 [159.99]
CC2	.626 [15.9]	.528 [13.41]	-1.735 [-44.07]	-11.822 [-300.28]	6.299 [159.99]
CY1	.626 [15.9]	.528 [13.41]	.000 [0]	14.126 [358.8]	3.617 [91.87]
E1	1.500 [38.1]	1.370 [34.8]	-15.345 [-389.76]	2.885 [73.28]	6.299 [159.99]
EX	1.500 [38.1]	1.370 [34.8]	15.355 [390.02]	2.929 [74.4]	6.299 [159.99]
MQX1	3.500 [88.9]	3.370 [85.6]	.000 [0]	-5.871 [-149.12]	6.299 [159.99]
MQX2	3.500 [88.9]	3.370 [85.6]	-5.902 [-149.91]	-.031 [-0.79]	6.299 [159.99]
WQX	41.535 [1055]	35.039 [890]	.000 [0]	2.953 [75.01]	.000 [0]
XB	3.500 [88.9]	3.370 [85.6]	.000 [0]	14.792 [375.72]	5.118 [130]

C

D1 PIPING INTERFACE
PER SPEC. LHC-DFBX-ES-230.00 REV 1.1

DFBX	PIPE OD/ID		PIPE COORDINATES AT 300 K		
DFBX	OD in [mm]	ID in [mm]	X in [mm] ±.08	Z in [mm] ±.08	Y in [mm] ±.08
V	3.06 [77.7]	2.91 [73.9]	.000 [0]	.000 [0]	-13.504 [-343]
LD1	1.75 [44.5]	1.66 [42.2]	8.359 [212.32]	-3.650 [-92.71]	-13.465 [-342.01]
CC2 END TRANSITION	.63 [16] .50 [12.7]	.53 [13.5] .41 [10.4]	5.429 [137.9]	.811 [20.6]	-14.843 [-377.01]
CC3	.63 [16]	.53 [13.5]	6.604 [167.74]	-7.879 [-200.13]	-14.843 [-377.01]
CY2 END TRANSITION	.63 [16] .50 [12.7]	.53 [13.5] .41 [10.4]	.000 [0]	5.114 [129.9]	-14.843 [-377.01]
Ex	1.50 [38.1]	1.38 [35.1]	6.441 [163.6]	-9.963 [-253.06]	-11.693 [-297]
E2	1.50 [38.1]	1.38 [35.1]	-6.546 [-166.27]	-9.036 [-229.51]	-11.693 [-297]
MBX1	3.50 [88.9]	3.38 [85.9]	.000 [0]	-5.249 [-133.32]	-3.780 [-96.01]
MBX2 END TRANSITION	.50 [12.7] 1.47 [37.3]	.38 [9.7] 1.34 [34]	3.862 [98.09]	-3.279 [-83.29]	-5.465 [-138.81]
WBX	29.53 [750.1]	23.50 [596.9]	.000 [0]	-3.528 [-89.61]	.000 [0]
XB END TRANSITION	2.88 [73.2] 2.00 [50.8]	2.72 [69.1] 1.88 [47.8]	-8.373 [-212.67]	-3.626 [-92.1]	-13.465 [-342.01]

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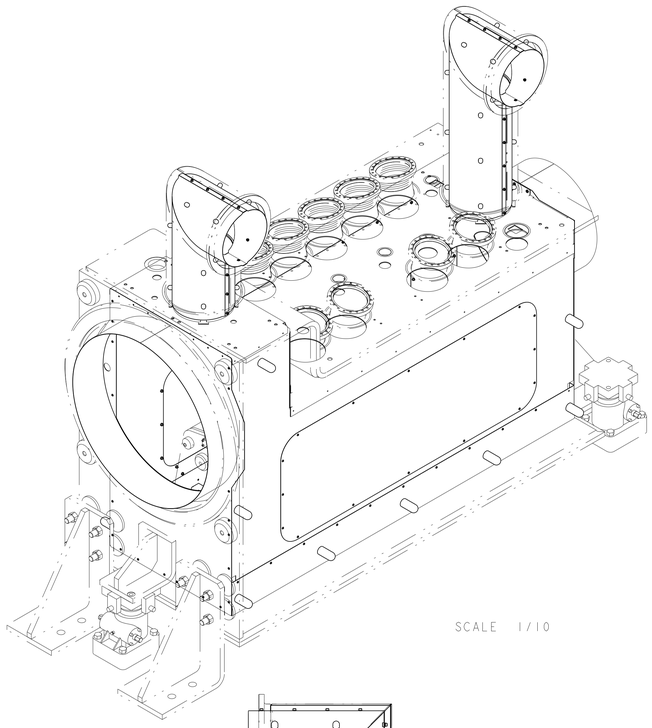
THIRD ANGLE PROJECTION

ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA · BERKELEY

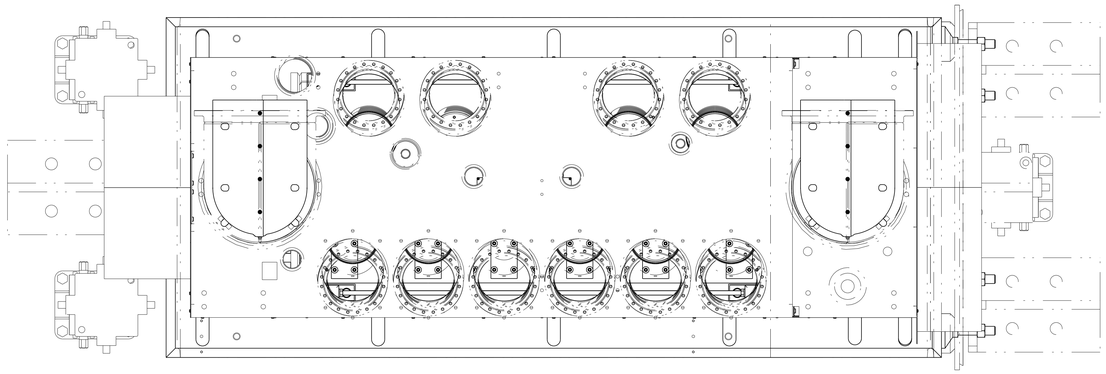
LHC IR FEEDBOX
MAJOR ASSEMBLY
DFBXC FEED BOX ASSY SKEL

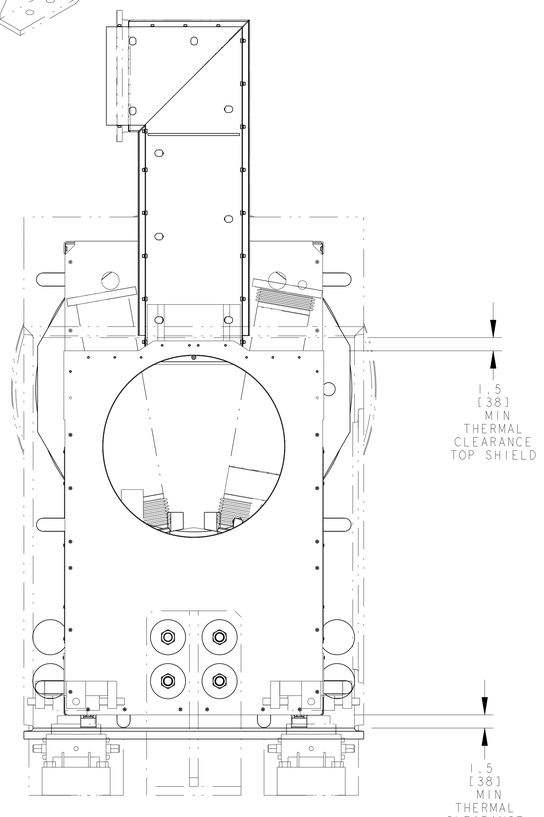
MICROFILMED:	DWG. TYPE	SHOWN ON	SCALE: 3/50 DO NOT SCALE PRINTS
	PART		SHEET 8 OF 11
PATENT CLEAR:	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO. SIZE REV.
	Z5LCE2	LH2001	24C3526 B

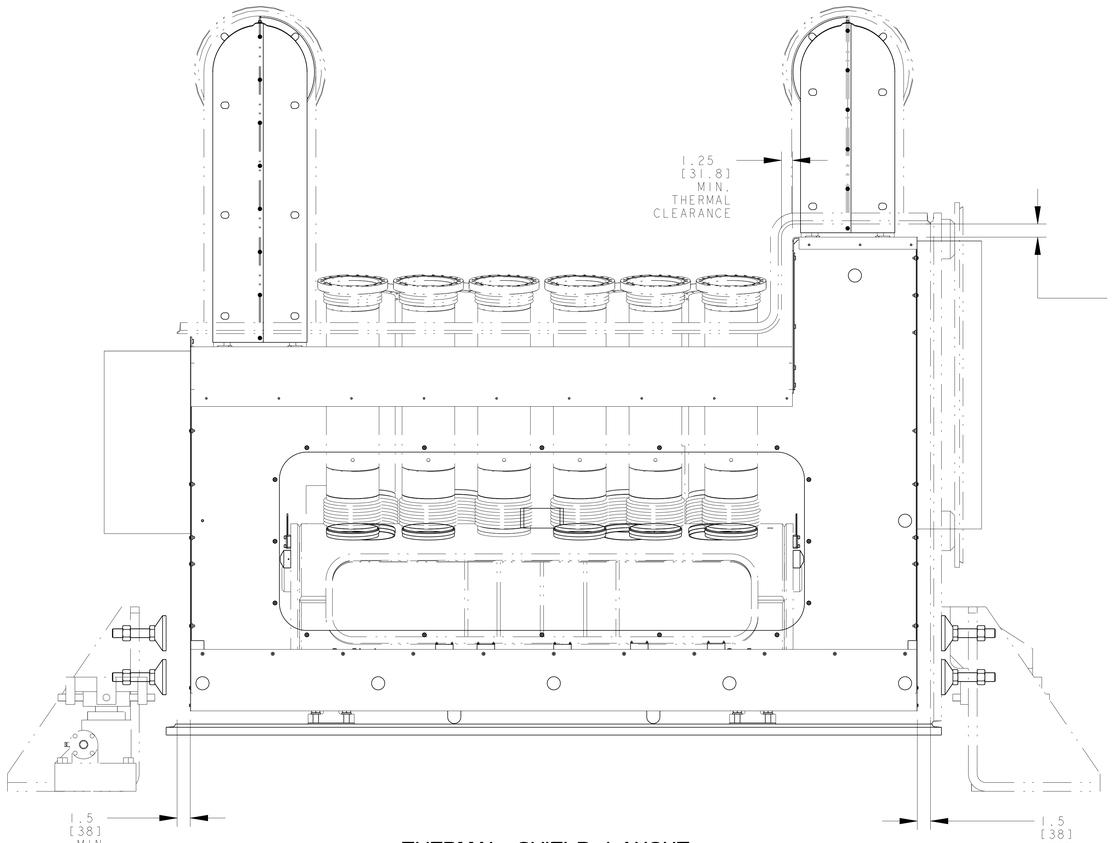
DWG. NO. 24C3526 SHEET REV. 8 B

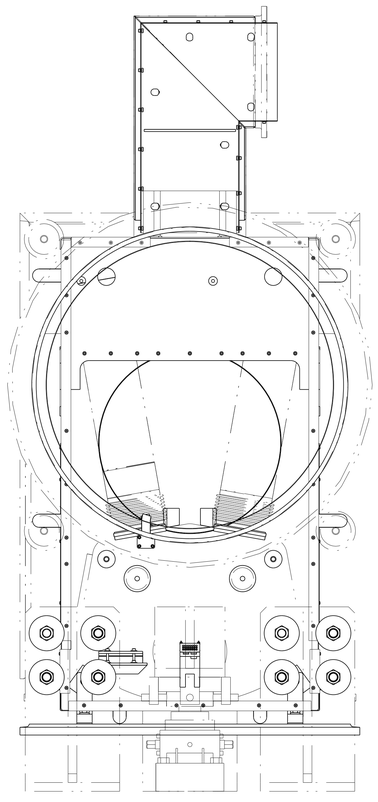


SCALE 1/10









THERMAL SHIELD LAYOUT
COMPONENTS REMOVED FOR CLARITY
SCALE 3/20

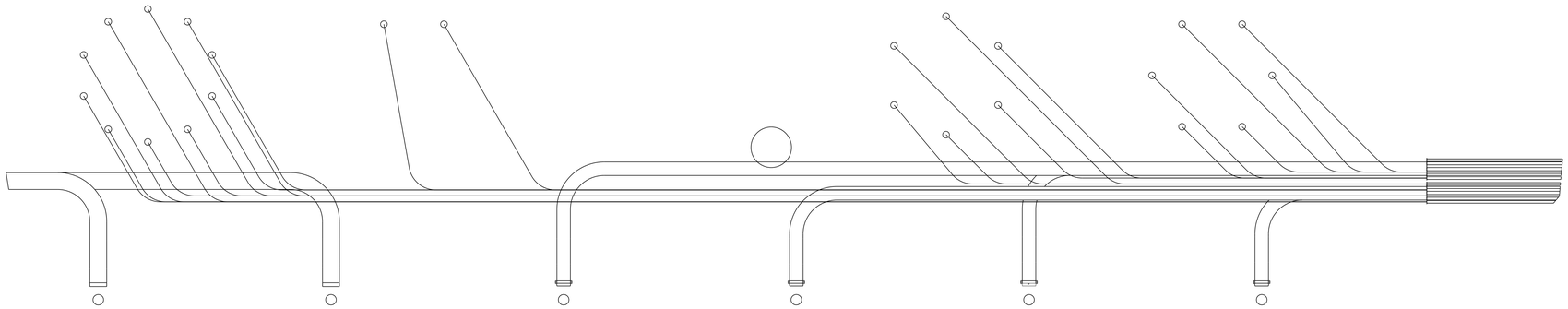
THIRD ANGLE PROJECTION

ERNEST ORLANDO LAWRENCE
BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA - BERKELEY

LHC IR FEEDBOX
MAJOR ASSEMBLY
DFBXC FEED BOX ASSY SKEL

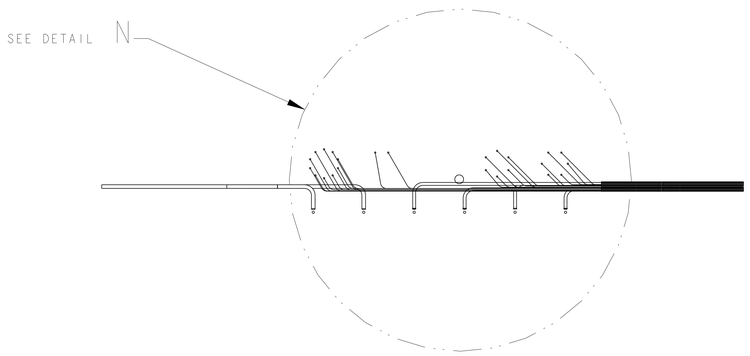
MICROFILMED:	DWG. TYPE	SHOWN ON	SCALE: 3/50	DO NOT SCALE PRINTS
	PART	-	SHEET 9 OF 11	
PATENT CLEAR:	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	Z5LCE2	LH2001	24C3526	B

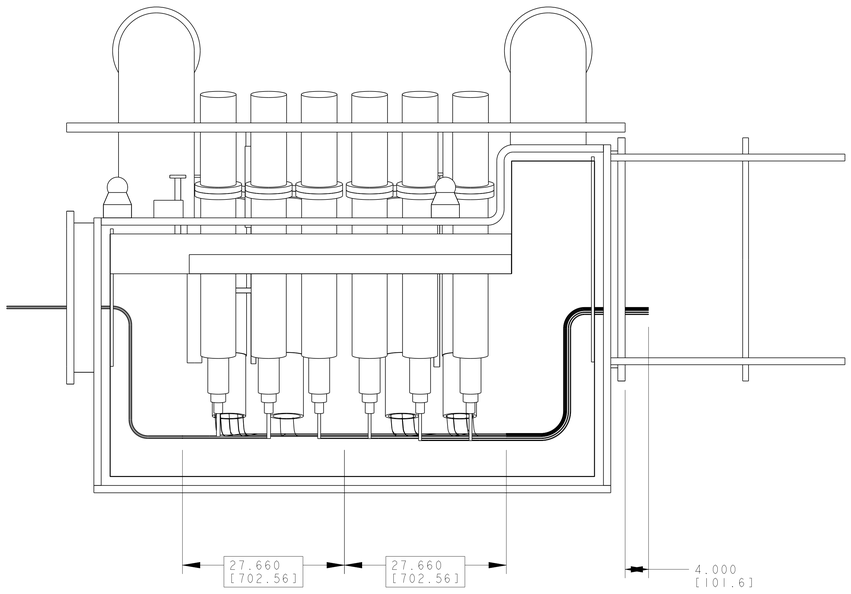
DWG. NO. 24C3526 SIZE B REV 9



BUS CONDUCTOR RUNS

DETAIL N
SCALE 1/2





SCALE 1/10

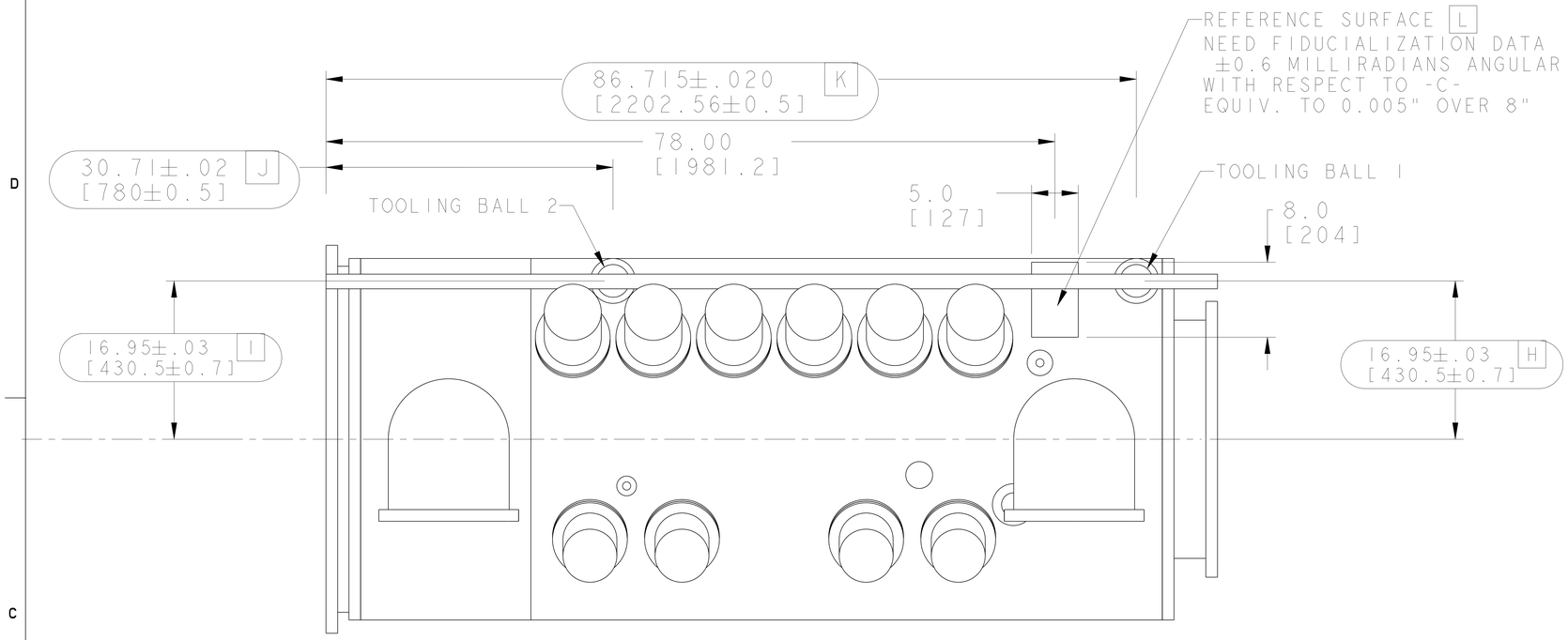
THIRD ANGLE PROJECTION

ERNEST ORLANDO LAWRENCE
BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA - BERKELEY

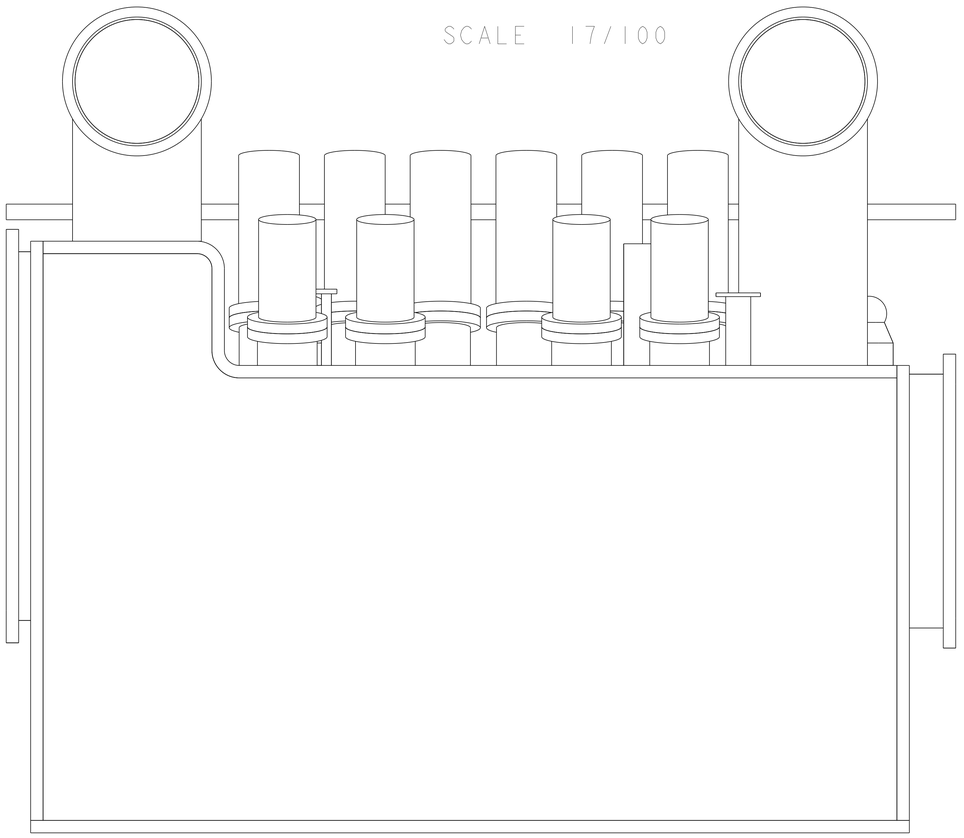
LHC IR FEEDBOX
MAJOR ASSEMBLY
DFBXC FEED BOX ASSY SKEL

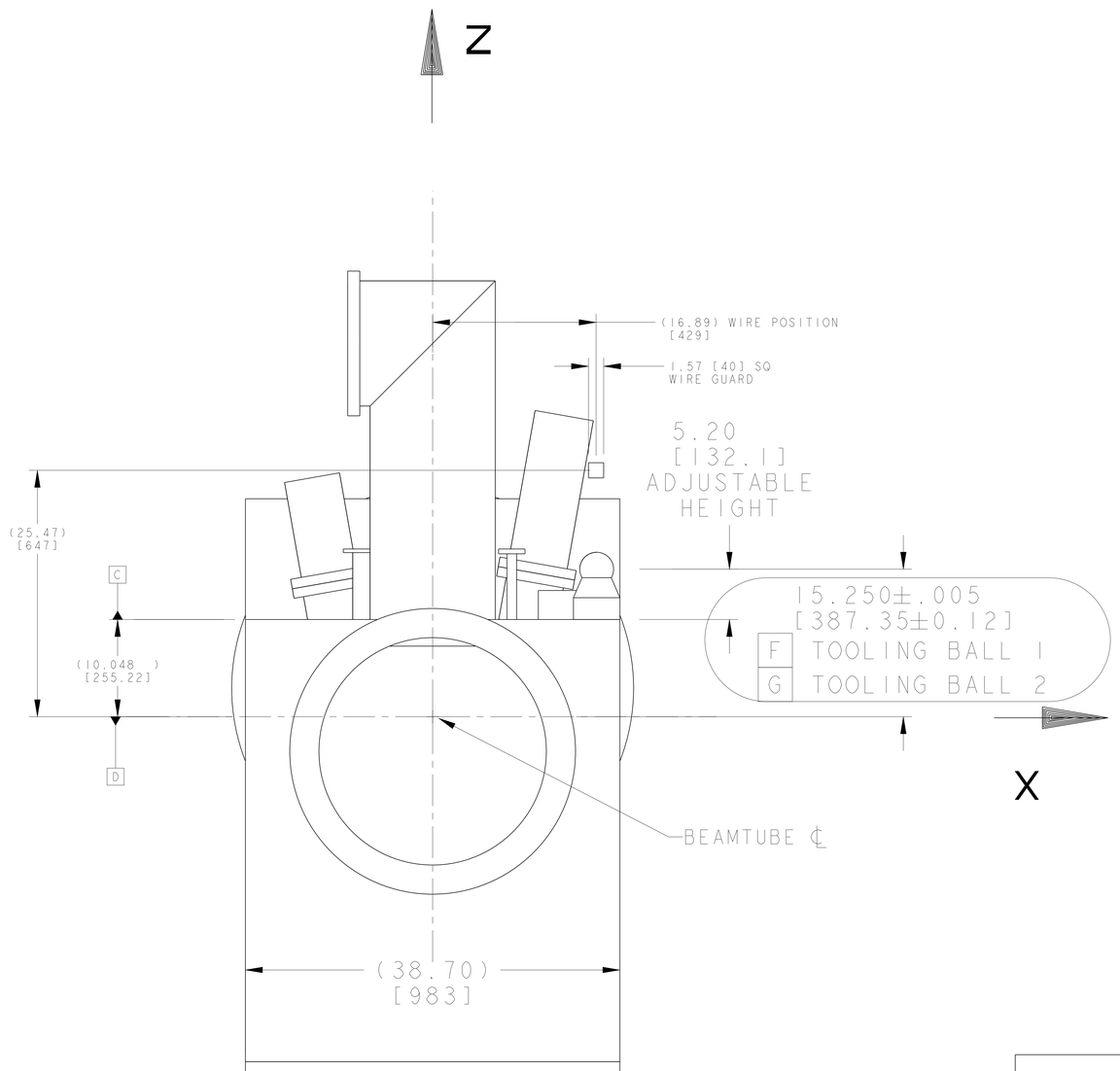
MICROFILMED:	DWG. TYPE: PART	SHOWN ON: -	SCALE: 3/50 DO NOT SCALE PRINTS
			SHEET 10 OF 11
PATENT CLEAR:	DESIGN ACCT. NO.: Z5LCE2	CATEGORY CODE: LH2001	DWG. NO.: 24C3526 SIZE: B REV.

DWG. NO. 24C3526 SIZE B SHEET 10



SCALE 17/100





FIDUCIAL LAYOUT INFORMATION

THIRD ANGLE PROJECTION

ERNEST ORLANDO LAWRENCE
BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA - BERKELEY

LHC IR FEEDBOX
MAJOR ASSEMBLY
DFBXC FEED BOX ASSY SKEL

MICROFILMED:	DWG. TYPE	SHOWN ON	SCALE: 3/50	DO NOT SCALE PRINTS
	PART	.	SHEET 11 OF 11	
PATENT CLEAR:	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	Z5LCE2	LH2001	24C3526	B

DWG. NO. 24C3526 SIZE / REV. B SH 11