

DFBX-H 24C362 Manufacturing Travelers

Production Floor Traveler

CONTROLLED DOCUMENT



Job Order 00918-0029

REV: 0 DATE: 4/28/05
APPROVED: [Signature]
Quantity 1.00

Part Number DFBX-H 24C362 FB Assy Revision NS U / M EA
Due Date 06/14/2005 Sales Order Coordinator: ECB Ship Item Y Ship Early Y Split Ship Y
Calc Rel Date 05/17/2005 Sales Order 000750 Customer: Lawrence Berkeley National Lab
Actual Rel Date 04/26/2005

Description	Operation	Work Center	Operation Quantity	Setup Time	Pieces per Hour	Operation Time	Move Time	Elapsed Time
DFBX-H 24C362 Feed Box Assembly								



10 WE 1.00 0.00 1.00 1.00 0.00 1.00
2-A WELDERS

Operation Description Detail :

- 1.0 Dwg 24C362 H Feed Box Assembly- Piping Assemblies Dwg 25I235
- 1.1 Pull the piping assemblies shown on 25I235.
- 1.2 Stage to Op20.



20 WE 1.00 0.00 1.00 1.00 0.00 1.00
2-A WELDERS

Operation Description Detail :

- 2.0 Dwg 24C362 H Feed Box Assembly- Bus Duct Q3 End Dwg 25I857
CUSTOMER WITNESS POINT.
Reference: Specification M994; Dwg 25C362; 25I235 Sht 10; 25M587; 25H400
Bus Duct 25M857 assembly to the Q3 End of the LHe Tank.
- 2.1 Remove the 25M857 MQX1 Pipe from the crate.
- 2.2 Enter the serial number of the 25M587 Bus Assembly below:

SN # ~~857~~ 7 By: ECK Date: 6-29-05

- 2.3 Remove the protective pipe cover from the conductors. Remove the protective Teflon tube form the conductors.
- 2.4 Clean for welding with acetone and isopropyl alcohol the end of the weld neck flange on the Bus Duct and the area on the LHe Tank end plate.
- 2.5 Place a protective Teflon sleeve in the LHe Tank end plate hole.
- 2.6 Carefully insert the conductors through the LHe Tank end plate hole, feeding the bus conductors though the Cable Looms to their intended splice location. Reference 25C362 sht 10 Detail N. Leave slack in the assembly so the piping portion of the Bus Duct can be fit to the LHe Vessel.
- 2.7 Fit the Bus Duct to the LHe vessel. Move the Tie Down Ring back out of the way. Assemble the Lambda Plug Flange to the LHe Tank end plate by using 4 clamps in the end plate bolt circle to clamp the Lambda Plug Flange to the LHe Tank. Bolts may be lubricated with a small amount of Krytox or Apiezon vacuum grease. Note the horizontal run of the Bus Duct must be supported during and after this assembly.
- 2.8 After assembly confirm that the Bus Duct is in positional location and level to the Top Plate per 24C362 sht 8. Record locations: (Use Romer Portable CMM or other suitable means.)

Production Floor Traveler

Date: 04/28/2005

Time - 13:03:31

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Job Order 00918-0029

Part Number DFBX-H 24C362 FB Assy Revision NS U / M EA Quantity 1.00
Due Date 06/14/2005 Sales Order Coordinator: ECB Ship Item Y Ship Early Y Split Ship Y
Calc Rel Date 05/17/2005 Sales Order 000750 Customer Lawrence Berkeley National Lab
Actual Rel Date 04/28/2005

Description	Operation	Work Center	Operation Quantity	Setup Time	Pieces per Hour	Operation Time	Move Time	Elapsed Time
DFBX-H 24C362 Feed Box Assembly								

X: _____

Y: _____

Z: _____

By: DJC Date: _____

2.9 Complete the assembly of the bus conductors in the Cable Looms and confirm that the conductors are all long enough to reach and complete their splices.

Confirmed By: A.K. Date: _____

2.10 From the inside of the LHe Tank, attach 4x-Omegalabel BU-100/38 temperature monitors on the Lambda Plate Housing at 4 equally spaced locations. These are for LBNL record. Attach thermocouple wire to the same area and bring the readout outside the LHe Tank where it can be monitored during welding.

2.11 Reference Dwg 24C362 Sht 4 Zone A3 for weld detail.

2.12 From the outside of the LHe Tank, proceed to weld the Lambda Plug Flange to the LHe Tank end plate in the following manner.

A. WPS GTAW-SS/LT. Monitor the temperature indicators at all times. Temperature not to exceed 40C (104F).

B. Tack weld the Flange at 4 equally spaced locations, 1" long x .06" fillet leg. Allow 4 tacks to cool to room temperature before proceeding. Check alignment.

C. Repeat step 5.3.2 for 4 more fleet tacks. Move clamps as needed. Check alignment.

D. Repeat step 5.3.2 for 4 more fleet tacks. Move clamps as needed. Check alignment.

E. Remove clamps and confirm that the Ring can be installed.

F. Complete the welding by repeating step 5.3.2 until the weld is complete.

G. Check alignment.

H. Install the Retaining Ring, tighten the 12 bolts in a star pattern to 25 ft-lb torque. Bolts may be lubricated with a small amount of Krytox or Apiezon vacuum grease

I. Tack weld the bolt heads to the Retaining Ring to prevent their loosening.

J. Remove the Omegalable temperature monitors and forward them to the project engineer for inclusion in the data package.

K. Remove the thermocouple wire.

2.13 Confirm that the Bus Duct is in positional location and level to the Top Plate per 24C362 sht 8. Record locations: (Use Romer Portable CMM or other suitable means.)

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Job Order 00918-0029

Part Number **DFBX-H 24C362 FB Assy** Revision **NS** U / M EA Quantity **1.00**
 Due Date **06/14/2005** Sales Order Coordinator **ECB** Ship Item **Y** Ship Early **Y** Split Ship **Y**
 Calc Rel Date **05/17/2005** Sales Order **000750** Customer **Lawrence Berkeley National Lab**
 Actual Rel Date **04/29/2005**

Description	Operation	Work Center	Operation Quantity	Setup Time	Pieces per Hour	Operation Time	Move Time	Elapsed Time
DFBX-H 24C362 Feed Box Assembly								

X: _____
 Y: _____
 Z: _____

By: DJC Date: _____

2.14 Stage to OP25.



25	WE	1.00	0.00	1.00	1.00	0.00	1.00
2-A WELDERS							

Operation Description Detail :

25.0 Dwg 24C362 H Feed Box Assembly- Bus Duct D1 End Dwg 25M859
CUSTOMER WITNESS POINT.

Reference: Specification M994; Dwg 25C362; 25I235 Sht 10; 25M859; 25H400
 Bus Duct 25M859 assembles to the D1 End of the LHe Tank.

25.1 Remove the 25M859 MBX1 Pipe from the crate.

25.2 Enter the serial number of the 25M859 Bus Assembly below:

SN #009 By: ECK Date: 6-29-05

25.3 Remove the protective pipe cover from the conductors. Remove the protective Teflon tube form the conductors.

25.4 Clean for welding with acetone and isopropyl alcohol the end of the weld neck flange on the Bus Duct and the area on the LHe Tank end plate.

25.5 Place a protective Teflon sleeve in the LHe Tank end plate hole.

25.6 Carefully insert the conductors through the LHe Tank end plate hole, feeding the bus conductors though the Cable Looms to their intended splice location. Reference 25C362 sht 10 Detail N. Leave slack in the assembly so the piping portion of the Bus Duct can be fit to the LHe Vessel.

25.7 Fit the Bus Duct to the LHe vessel. Move the Tie Down Ring back out of the way. Assemble the Lambda Plug Flange to the LHe Tank end plate by using 4 clamps in the end plate bolt circle to clamp the Lambda Plug Flange to the LHe Tank. Bolts may be lubricated with a small amount of Krytox or Apiezon vacuum grease. Note the horizontal run of the Bus Duct must be supported during and after this assembly.

25.8 After assembly confirm that the Bus Duct is in positional location and level to the Top Plate per 24C362 sht 8. Record locations: (Use Romer Portable CMM or other suitable means.)

X: _____

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Job Order 00918-0029

Part Number DFBX-H 24C362 FB Assy Revision NS U / M EA Quantity 1.00
Due Date 06/14/2005 Sales Order Coordinator ECB Ship Item Y Ship Early Y Split Ship Y
Calc Rel Date 05/17/2005 Sales Order 000750 Customer Lawrence Berkeley National Lab
Actual Rel Date 04/26/2005

Operation	Work Center	Operation Quantity	Setup Time	Pieces per Hour	Operation Time	Move Time	Elapsed Time
Description	DFBX-H 24C362 Feed Box Assembly						

Y: _____

Z: _____

* By: DJC Date: _____

25.9 Complete the assembly of the bus conductors in the Cable Looms and confirm that the conductors are all long enough to reach and complete their splices.

Confirmed By: A.K. Date: _____

25.10 Remove the Teflon sleeve from the end plate hole.

25.11 From the inside of the LHe Tank, attach 4x-Omegalabel BU-100/38 temperature monitors on the Lambda Plate Housing at 4 equally spaced locations. These are for LBNL record. Attach thermocouple wire to the same area and bring the readout outside the LHe Tank where it can be monitored during welding.

25.12 Reference Dwg 24C362 Sht 4 Zone A3 for weld detail.

25.13 From the outside of the LHe Tank, proceed to weld the Lambda Plug Flange to the LHe Tank end plate in the following manner.

A. WPS GTAW-SS/LT. Monitor the temperature indicators at all times.

Temperature not to exceed 40C (104F).

B. Tack weld the Flange at 4 equally spaced locations, 1" long x .06" fillet leg. Allow 4 tacks to cool to room temperature before proceeding. Check alignment.

C. Repeat step 5.3.2 for 4 more fleet tacks. Move clamps as needed. Check alignment.

D. Repeat step 5.3.2 for 4 more fleet tacks. Move clamps as needed. Check alignment.

E. Remove clamps and confirm that the Ring can be installed.

F. Complete the welding by repeating step 5.3.2 until the weld is complete.

G. Check alignment.

H. Install the Retaining Ring, tighten the 12 bolts in a star pattern to 25 ft-lb torque. Bolts may be lubricated with a small amount of Krytox or Apiezon vacuum grease

I. Tack weld the bolt heads to the Retaining Ring to prevent their loosening.

J. Remove the Omegalable temperature monitors and forward them to the project engineer for inclusion in the data package.

K. Remove the thermocouple wire.

25.14 Confirm that the Bus Duct is in positional location and level to the Top Plate per 24C362 sht 8. Record locations: (Use Romer Portable CMM or other suitable means.)

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Job Order 00918-0029

Part Number DFBX-H 24C362 FB Assy Revision NS U / M EA Quantity 1.00
 Due Date 06/14/2005 Sales Order Coordinator: ECB Ship Item Y Ship Early Y Split Ship Y
 Calc Ref Date 05/17/2005 Sales Order: 000750 Customer: Lawrence Berkeley National Lab
 Actual Ref Date 04/28/2005

Description	Operation	Work Center	Operation Quantity	Setup Time	Pieces per Hour	Operation Time	Move Time	Elapsed Time
DFBX-H 24C362 Feed Box Assembly								

X: _____
 Y: _____
 Z: _____

By: DJC Date: _____

25.15 Stage to OP30.



30	WE	1.00	0.00	1.00	1.00	0.00	1.00
2-A WELDERS							

Operation Description Detail :

3.0 Dwg 24C362 H Feed Box Assembly

3.1 Reference drawing 24C362 Sheet 5 Section A-A. Fit up the two LHe tank Covers (dwg 251119 and 25M802) to the LHe tank. Seal weld the covers to the LHe tank, minimum of .045" fillet or groove welds.

3.2 Stage to OP40.



40	AS	1.00	0.00	0.08	12.00	0.00	12.00
3-A ASSEMBLY							

Operation Description Detail :

4.0 Dwg 24C362 H Feed Box Assembly

(Note: Welds for DH Line, Helium Tank Piping, and CC1 Lines previously cold shocked in subjob-0030.)

4.1 Cold Shocking: Cold Shock per MTM-MP-1040.

1. Spray with liquid nitrogen the weld between the LHe Tank and Chimney. Use a thermocouple to monitor temperature. Achieve a temperature of ~ -280 F (100K) at the joint.
2. Use the heat gun to warm the joint back up to ~ 70 F.
3. Repeat 20 times for each Chimney.
4. Do above in a rotation, 1st person sprays to achieve cold temperature, moves on to next Chimney, 2nd person warms joint back to room temperature.

4.2 Install the pressure test clamp between the Top Plate and LHe Tank.

4.3 Perform a safety check. Confirm that all ports that will see pressure are safely flanged or welded closed. Confirm that all bellows are properly restrained (no squirm protection is required) at end points.

4.4 Perform pneumatic pressure test utilizing nitrogen gas per MTM-MP-1105 to 63.6 psig. Forward the test report to the project engineer.

4.5 After the pressure test. Remove clamp. Evacuate the LHe tank assembly and vacuum leak test per MTM-MP-1110. Acceptance criteria 1x10⁻⁹ std cc/sec

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 Due Date 06/14/2005 Sales Order Coordinator ECB Ship Item Y Ship Early Y Split Ship Y
 Calc Rel Date 05/17/2005 Sales Order 000750 Customer Lawrence Berkeley National Lab
 Actual Rel Date 04/28/2005

Description	Operation	Work Center	Operation Quantity	Setup Time	Pieces per Hour	Operation Time	Move Time	Elapsed Time
DFBX-H 24C362 Feed Box Assembly								

helium. BAG all bellows (one at a time). Include the LHe Tank to Bellows and the Bellows to Chimney Tube welds in bag. Flood the bag with helium gas. Forward the test report to the project engineer.

4.6 Stage to OP50.



50	WE	1.00	0.00	0.25	4.00	0.00	4.00
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2-A WELDERS

Operation Description Detail :

5.0 Dwg 24C362 H Feed Box Assembly

5.1 Reference drawing 24C362 Sheet 5 Section A-A. Remove the two LHe tank Covers (dwg 25I119 and 25M802) from the LHe tank.

5.2 Stage to OP60.



60	WE	1.00	0.00	1.00	1.00	0.00	1.00
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2-A WELDERS

Operation Description Detail :

6.0 Dwg 24C362 H Feed Box Assembly-Piping Assemblies Dwg 25I235

6.1 Install the following piping and G10 support assemblies shown on dwg 25I235.

1. Dwg 25I247 Pipe Weldment, LD3 and Bus Duct Qty 1
2. Dwg 25I855 V Pipe and Jacket Assembly Qty 1
3. Dwg 25I253 Pipe, XB Qty 1
4. Dwg 25I303 Pipe, CY1 Qty 1
5. Dwg 25I236 Pipe, CC1 Qty 1
6. Dwg 25I237 Pipe, CC2 Qty 1
7. Dwg 25I238 Pipe, CC3 Qty 1
8. Dwg 25I239 Pipe, CY2 Qty 1
9. Dwg 25I242 Pipe, E1 Qty 1
10. Dwg 25I243 Pipe, E2 Qty 1
11. Dwg 25I245 Pipe, LD2 Qty 1
12. Dwg 25I243 Pipe, LD1 Qty 1
13. Dwg 25I301 MQX2, Instrumentation Line Qty 1

Customer Witness Point. Install 25I235-16 (25I301 Pipe, MQX2). Weld to Top Plate at MQX port (24C362 Section F-F). Be careful of instrumentation wires. Follow M996 procedure up to step 4.2.7.

Record SN: 08 By: _____ Date: _____

14. Dwg 25I249 MBX2, Instrumentation Line Qty 1

Customer Witness Point. Install 25I235-14 (25I249 Pipe, MBX2). Weld to Top

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 Due Date 06/14/2005 Sales Order Coordinator ECB Ship Item Y Ship Early Y Split Ship Y
 Calc Rel Date 05/17/2005 Sales Order 000750 Customer Lawrence Berkeley National Lab
 Actual Rel Date 04/28/2005

Description	Operation	Work Center	Operation Quantity	Setup Time	Pieces per Hour	Operation Time	Move Time	Elapsed Time
DFBX-H 24C362 Feed Box Assembly								

Plate at MBX port (24C362 Section G-G). Be careful of instrumentation wires.
 Follow M996 procedure up to step 4.2.7.

Record SN: D401 By: _____ Date: _____

- 15. Dwg 25I610 Center Pipe Support Qty 1
- 16. Dwg 25I097 G10 Support
- 17. Dwg 25I098 G10 Support
- 18. Dwg 25I412 G10 Support
- 19. Dwg 25I413 G10 Support
- 20. Perform weld between Top Plate Ring and the Top Plate around the MQX2 line.
per 24C362 Section F-F.
- 6.2 Pre-insulate piping with 10 layers of MLI as appropriate.
- 6.3 Identify new welds with tags for cold shocking in OP70.

6.4 Following LBNL procedure install the 5x Cernox temperature sensors on the following pipes:

- 1. The LHe Vessel 25I573. (TT831)
- 2. The DH Line 25I241. (TT890)
- 3. The CY2 Line 25I813. (TT813)
- 4. Wire only from connector Cern to do sensors. (TT819a, TT819b)
- 5. The CY1 Line 25I3033. (TT812)

6.5 Route 5 sets of Cernox temperature sensor wires to the Pumping Port, Cryogenic Diagnostic Assy (24C362 Sht 6 Section L-L)

6.7 Perform continuity testing of the temperature sensors and wire. Use reports from LBNL for sensors. Forward reports to the project engineer.

6.8 Stage to OP70.

70 AS	1.00	0.00	0.08	12.00	0.00	12.00
3-A ASSEMBLY						

Operation Description Detail :

- 7.0 Dwg 24C362 H Feed Box Assembly-Piping Assemblies Dwg 25I235
- 7.1 Cold shock per MTM-MP-1020 the new welds tagged in OP60 on the following lines:
 - 1. Dwg 25I247 Pipe Weldment, LD3 and Bus Duct Qty 1
 - 2. Dwg 25I855 V Pipe and Jacket Assembly Qty 1
 - 3. Any other weld identified by the welder in OP60.
 - 4. Forward reports to the Project Engineer.
- 7.2 Pressure test the spools with new welds to:

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Job Order 00918-0029

Part Number DFBX-H 24C362 FB Assy Revision NS U / M EA Quantity 1.00
 Due Date 06/14/2005 Sales Order Coordinator ECB Ship Item Y Ship Early Y Split Ship Y
 Calc Rel Date 05/17/2005 Sales Order 000750 Customer Lawrence Berkeley National Lab
 Actual Rel Date 04/28/2005

Description	Operation	Work Center	Operation Quantity	Setup Time	Pieces per Hour	Operation Time	Move Time	Elapsed Time
DFBX-H 24C362 Feed Box Assembly								

1. Dwg 251247 Pipe Weldment, LD3 and Bus Duct Qty 1 364 PSIG
2. Dwg 251855 V Pipe and Jacket Assembly Qty 1 (JACKET ONLY!)
3. Any other line with a new weld identified by the welder in OP60.
4. Forward reports to the Project Engineer.
- 7.2 HMSLD leak test the spools with new welds to:
 1. Dwg 251247 Pipe Weldment, LD3 and Bus Duct Qty 1 364 PSIG
 2. Dwg 251855 V Pipe and Jacket Assembly Qty 1 (JACKET ONLY!)
 3. Any other line with a new weld identified by the welder in OP60.
 4. Forward reports to the Project Engineer.
- 7.3 Reference Dwg 24C362 sheet 6 Section F-F Blank off the MQX2 instrumentation line and the Q3 end and the Top Plate end. HMSLD test the MQX2 line weld to the top plate at the and the Porcupine Mounting Ring to Top Plate weld. Forward the test report to the Project Engineer.
- 7.4 Reference Dwg 24C362 sheet 6 Section G-G Blank off the MBX2 instrumentation line at the D1 end and the Top Plate end. HMSLD test the MBX2 line weld to the top plate and the and the Porcupine Mounting Ring to Top Plate weld. Forward the test report to the Project Engineer.
- 7.5 Stage to OP80.



80	AS	1.00	0.00	1.00	1.00	0.00	1.00
3-A ASSEMBLY							

Operation Description Detail :

8.0 Dwg 24C362 H Feed Box Assembly- (Weld and Assembly)
 Customer Witness Point.

Reference Specification M996; Dwg 251874; 24C362

8.1 Pull the instrumentation wires from 251874-5 (24C362 Section F-F) up through the Top Plate. Pull the staged kit for 251831. Fit the Item 251831-5 and 251831-7 to the Top Plate. Protect wires from high frequency. Wind the bundles for feedthru holes A through L counterclockwise 4 twists and insert the bundles through the appropriate hole in the LQX Diagnostic Assy. Pull the thermometer wires thru the top hole of the porcupine.

8.2 Perform a continuity check of wires to check received condition.

Continuity Check: Pass/Fail? By: DM Date: 8-8-05

8.3 Solder the wires to the connector pins per wiring diagram 251260.

8.4 Perform a continuity check of wires. Complete a test report and forward to the project engineer.

Continuity Check: Pass/Fail? By: ced Date: 8-8-05

Wiring Correct Confirmed by: ced Date: 8-8-05

8.5 Mix a batch of Stycast 2850MT (blue). De-gas by placing in container and

except 30 pin OK ced 8-9-05

Production Floor Traveler



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Part Number DFBX-H 24C362 FB Assy Revision NS U / M EA Quantity 1.00
Due Date 06/14/2005 Sales Order Coordinator ECB Ship Item Y Ship Early Y Split Ship Y
Calc Rel Date 05/17/2005 Sales Order 000750 Customer Lawrence Berkeley National Lab
Actual Rel Date 04/28/2005

Description	Operation	Work Center	Operation Quantity	Setup Time	Pieces per Hour	Operation Time	Move Time	Elapsed Time
DFBX-H 24C362 Feed Box Assembly								

with quartz window, evacuate. The Stycast is de-gassed when it stops bubbling.

8.6 Encapsulate the soldered connections in the de-gassed Stycast 285MT(blue).

Allow the epoxy to cure.

8.7 Perform a continuity check of wires. Complete a test report and forward to the project engineer.

Continuity Check: Pass Fail? By: DJC SK Date: _____

8.8 Fit the 12 Cermaseal feedthrus to the LQX Porcupine and install the 25I831-5 connector assembly in the top hole of the Porcupine. Tack to position.

8.9 Hipot test (in air) the LQX Porcupine feedthrus as follows.

Voltage Taps (in air) 5000 V; I<5 micro amps

Quench Protection Heaters (in air) 5000 V; I<5 micro amps

Warm up Heaters (in air) 2500 V; I<7 micro amps

Cold mass thermometers (in air) 300 V; I<2 micro amps

Print out the test reports.

8.10 Weld 12x feedthrus to porcupine

8.11 Weld 25I831 connector to porcupine

8.12 Weld the Porcupine to the Connector Ring.

8.13 Perform a continuity check of wires. Complete a test report and forward to the project engineer.

Continuity Check: Pass Fail? By: DJC SK Date: _____

8.14 Hipot test (in air) the LQX Porcupine feedthrus as follows.

Voltage Taps (in air) 5000 V; I<5 micro amps

Quench Protection Heaters (in air) 5000 V; I<5 micro amps

Warm up Heaters (in air) 2500 V; I<7 micro amps

Cold mass thermometers (in air) 300 V; I<2 micro amps

Print out the test reports.

8.15 Solder the 5 sets of Cernox temperature sensor wires to the 32 pin connector located at the Pumping Port, Cryogenic Diagnostic Assy (24C362 Sht 6 Section L-L) per the electrical schematic 25I620 REV C. Solder the spare wires (wire provided by LBNL) to the connector per the electrical schematic. Route the spare wires to the D1 End.

8.15 Perform continuity testing of the temperature sensors and the spare wires.

Forward reports to the project engineer.

Continuity Check: Pass/Fail? By: DJC Date: 04/28/05

8.16 Mix a batch of Stycast 2850MT (blue). De-gas by placing in container and with quartz window, evacuate. The Stycast is de-gassed when it stops

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Description	Operation	Work Center	Operation Quantity	Setup Time	Pieces per Hour	Operation Time	Move Time	Elapsed Time
DFBX-H 24C362 Feed Box Assembly								

bubbling.

8.17 Encapsulate the soldered connections in the de-gassed Stycast 285MT(blue).
Allow the epoxy to cure.

8.18 Perform continuity testing of the temperature sensors and the spare wires.
Forward reports to the project engineer.

Continuity Check: Pass/Fail? By: CD Date: 10/21/05

8.19 Hipot test (in air) the 32 Pin Connector
Cernox thermometers and spare wires (in air) 300 V; I<2 micro amps
Print the report and forward it to the project engineer.

8.20 Weld the 32 Pin Connetor to the assembly.

8.21 Hipot test (in air) the 32 Pin Connector
Cernox thermometers and spare wires (in air) 300 V; I<2 micro amps
Print the report and forward it to the project engineer.

8.22 Reference Specification M996; Dwg 25I235 sheet 3; 24C362; 25I249

1. Pull the instrumentation wires from 25I249 (24C362 Section G-G up through the Top Plate. Pull the staged kit for 25I163. Fit the Item 25I163-1/4 weldment to the Top Plate. Protect wires from high frequency.

2. Perform a continuity check of wires to check received condition.
Continuity Check: Pass/Fail? By: MJK Date: _____

3. Weld Body to Top Plate.

4. Solder the wires to the connector pins per wiring diagram 25I620 Item 6.

5. Perform a continuity check of wires. Complete a test report and forward to the project engineer.

Continuity Check: Pass/Fail? By: CD Date: _____

Wiring Correct Confirmed by: D. H Date: _____

6. Mix a small batch of Stycast 2850MT Blue. De-gas by placing in container and with quartz window, evacuate. The Stycast is de-gassed when it stops bubbling.

7. Encapsulate the soldered connections in the de-gassed Stycast 2850MT(blue).
Pour it into a cut out paper cup surrounding the pins. Allow the epoxy to cure.

8. Perform a continuity check of wires to check received condition. Complete a test report and forward to the project engineer.

9. Continuity Check: Pass/Fail? By: MJK Date: _____

10. Hipot test (in air) the MBX2 Instrumentation feedthrus as follows.

Voltage Taps (in air) 5000 V; I<5 micro amps

Quench Protection Heaters (in air) 5000 V; I<5 micro amps

Warm up Heaters (in air) 2500 V; I<7 micro amps

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DFBX-H 24C362 Feed Box Assembly								

Cold mass thermometers (in air) 300 V; I<2 micro amps
Print out the test reports.

- 11. Weld Top Plate with connectors to Body.
- 12. Continuity Check: Pass/Fail? By: CD Date: _____
- 13. Hipot test (in air) the MBX2 Instrumentation feedthrus as follows.
Voltage Taps (in air) 5000 V; I<5 micro amps
Quench Protection Heaters (in air) 5000 V; I<5 micro amps
Warm up Heaters (in air) 2500 V; I<7 micro amps
Cold mass thermometers (in air) 300 V; I<2 micro amps
Print out the test reports.
- 14. Stage to OP90.



90	AS	1.00	0.00	1.00	1.00	0.00	1.00
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3-A ASSEMBLY

Operation Description Detail :

- 9.0 Dwg 24C362 H Feed Box Assembly- Item 11 120 Amp VC Lead Splicing & Testing
CUSTOMER WITNESS POINT.
Reference: Specification M983; Dwg 25C362; 25C322; 25I864
Read and follow the M983 procedure with the Traveler. Drawing 25I864 gives an overview of the position of the components 24C362 Sht 10 Detail N gives an overview of the conductor locations.
- 9.1 Install Item 11 the 120 AMP VC Power Lead in the Feed Box. Lubricate the M8 bolts for the CF flange with vacuum grease. Torque to standard CF flange seal value.
- 9.2 Cover the bottom of the LHe Vessel with a plastic sheet.
- 9.3 Follow procedure steps 1 through 3 for all ten 120 AMP leads. (Reference 25I260 for wire layout)

Wire Layout Completed: D. NL. Date: _____

* Confirmed Correct: DJC Date: _____

- 9.4 Follow procedure steps 4 thorough 11 for all 10 leads.
- 9.5 Step 12 . Perform a electrical continuity test to verify that the correct bus wire has been connected to the correct lead. (Reference 251615 Detail 2)

Continuity Test: Pass Fail By: DJC Date: _____

Production Floor Traveler



Job Order 00918-0029

Part Number DFBX-H 24C362 FB Assy Revision NS U / M EA Quantity 1.00
 Due Date 06/14/2005 Sales Order Coordinator: ECB Ship Item Y Ship Early Y Split Ship Y
 Calc Rel Date 05/17/2005 Sales Order 000750 Customer Lawrence Berkeley National Lab
 Actual Rel Date 04/28/2005

	Operation	Work Center	Operation Quantity	Setup Time	Pieces per Hour	Operation Time	Move Time	Elapsed Time
Description	DFBX-H 24C362 Feed Box Assembly							

9.6 Follow procedure steps 13 through 15.

Completed By: DJK Date: _____

9.7 Perform the Hipot Electrical Performance Test per the Procedure. Make sure that the free ends of the Voltage Tap wires are not grounded.
 TAPE OFF THE AREA AND PUT UP HIGH VOLTAGE SIGNS.
 INFORM THE AREA SUPERVISOR THAT THE TEST IS TAKING PLACE.
 Complete the test per the procedure for each of 10 leads in the 120 AMP Power Lead.

Print out hipot test (in air) results and forward to project engineer.

Completed By: DJK Date: _____

9.8 Stage to OP100.

Record the Serial No. 340731A



100 AS 1.00 0.00 0.04 24.00 0.00 24.00
 3-A ASSEMBLY

Operation Description Detail :

10.0 Dwg 24C362 H Feed Box Assembly- Item 12 Qty 2 600 Amp 6-Lead Assy Splicing & Testing Qty 2

CUSTOMER WITNESS POINT.

Reference: Specification M982; Dwg 25C362; 24C353; 25I864

Read and follow the M982 procedure with the Traveler. Drawing 25I864 gives an overview of the position of the components 24C362 Sht 10 Detail N gives an overview of the conductor locations.

10.1 Install Item 12 the 600 AMP 6-Lead Power Lead in the Feed Box. Lubricate the M8 bolts for the CF flange with vacuum grease. Torque to standard CF flange seal value.

10.2 Cover the bottom of the LHe Vessel with a plastic sheet.

10.3 Follow procedure steps 1 through 3 for the 2 leads. (Reference 251617 for wire layout)

Wire Layout Completed: DJK Date: _____

Confirmed Correct: DJK Date: _____

Production Floor Traveler



Job Order 00918-0029

Part Number **DFBX-H 24C362 FB Assy** Revision **NS** U / M EA Quantity **1.00**
 Due Date **06/14/2005** Sales Order Coordinator **ECB** Ship Item **Y** Ship Early **Y** Split Ship **Y**
 Calc Rel Date **05/17/2005** Sales Order **000750** Customer **Lawrence Berkeley National Lab**
 Actual Rel Date **04/28/2005**

	Operation	Work Center	Operation Quantity	Setup Time	Pieces per Hour	Operation Time	Move Time	Elapsed Time
Description	DFBX-H 24C362 Feed Box Assembly							

10.4 Follow procedure steps 4 thorough 11 for both leads.

10.5 Step 12 . Perform a electrical continuity test to verify that the correct bus wire has been connected to the correct lead. (Reference 251620 Detail 1)

* Continuity Test: Pass/Fail By: ^{GK} DC Date: _____

10.6 Follow procedure steps 13 through 15.

Completed By: JK Date: _____

10.7 Perform the HiPot Electrical Performance Test per the Procedure. Make sure that the free ends of the Voltage Tap wires are not grounded.

TAPE OFF THE AREA AND PUT UP HIGH VOLTAGE SIGNS.

INFORM THE AREA SUPERVISOR THAT THE TEST IS TAKING PLACE.

Complete the test per the procedure for each of leads in the 600 AMP Power Lead.

Print out hipot test (in air) results and forward to project engineer.

Completed By: ^{DJR} DJC Date: _____

10.8 Repeat for second Item 12.

10.9 Wire Layout Confirmation.

Wire Layout Completed: JK Date: _____

* Confirmed Correct: DSC Date: _____

10.10 Continuity Test

* Continuity Test: Pass/Fail By: DSC Date: _____

10.11 Hipot Test

Print out hipot test (in air) results and forward to project engineer.

Completed By: JK Date: JK

10.12 Stage to OP110.

Production Floor Traveler



Job Order 00918-0029

Part Number DFBX-H 24C362 FB Assy Revision NS U / M EA Quantity 1.00
 Due Date 06/14/2005 Sales Order Coordinator ECB Ship Item Y Ship Early Y Split Ship Y
 Calc Rel Date 05/17/2005 Sales Order 000750 Customer Lawrence Berkeley National Lab
 Actual Rel Date 04/28/2005

Description	Operation	Work Center	Operation Quantity	Setup Time	Pieces per Hour	Operation Time	Move Time	Elapsed Time
DFBX-H 24C362 Feed Box Assembly								

Record the Serial No. (1-6) 3W0731B

Record the Serial No. (7-12) 3W0731C



110 AS	1.00	0.00	0.10	10.00	0.00	10.00
3-A ASSEMBLY						

Operation Description Detail :

11.0 Dwg 24C362 H Feed Box Assembly- Item 29 600 Amp 2-Lead Assy Splicing & Testing
 CUSTOMER WITNESS POINT. Qty 1

Reference: Specification M982; Dwg 25C362; 25I164; 25I864

Read and follow the M982 procedure with the Traveler. Drawing 25I864 gives an overview of the position of the components 24C362 Sht 10 Detail N gives an overview of the conductor locations.

11.1 Install Item 36 the 600 AMP 2-Lead Power Lead in the Feed Box. Lubricate the M8 bolts for the CF flange with vacuum grease. Torque to standard CF flange seal value.

11.2 Cover the bottom of the LHe Vessel with a plastic sheet.

11.3 Follow procedure steps 1 through 3 for the 2 leads. (Reference 251620 Detail 1 for wire layout)

Wire Layout Completed: DJC Date: _____

X Confirmed Correct: A.K. Date: _____

11.4 Follow procedure steps 4 thorough 11 for both leads.

11.5 Step 12 . Perform a electrical continuity test to verify that the correct bus wire has been connected to the correct lead. (Reference 251615 Detail 1)

X Continuity Test: Pass/Fail By: DJC Date: _____

11.6 Follow procedure steps 13 through 15.

X Completed By: DJC/GK Date: _____

11.7 Perform the Hipot Electrical Performance Test per the Procedure. Make sure that the free ends of the Voltage Tap wires are not grounded.

TAPE OFF THE AREA AND PUT UP HIGH VOLTAGE SIGNS.

INFORM THE AREA SUPERVISOR THAT THE TEST IS TAKING PLACE.

Complete the test per the procedure for each of leads in the 600 AMP Power Lead.

Production Floor Traveler



Job Order 00918-0029

Part Number **DFBX-H 24C362 FB Assy** Revision **NS** U / M **EA** Quantity **1.00**
 Due Date **06/14/2005** Sales Order Coordinator **ECB** Ship Item **Y** Ship Early **Y** Split Ship **Y**
 Calc Rel Date **05/17/2005** Sales Order **000750** Customer **Lawrence Berkeley National Lab**
 Actual Rel Date **04/28/2005**

Operation	Work Center	Operation Quantity	Setup Time	Pieces per Hour	Operation Time	Move Time	Elapsed Time
Description	DFBX-H 24C362 Feed Box Assembly						

Lead#1 Reading: SEE REPORT Lead#2 Reading: SEE REPORT

Completed By: AK Date: _____
 11.8 Stage to OP120

Record the Serial No. 360731A



120 AS 1.00 0.00 0.03 30.00 0.00 30.00
 3-A ASSEMBLY

Operation Description Detail :

12.0 Dwg 24C362 H Feed Box Assembly- Item 8 Qty 6 HTS Leads Assy Splicing & Testing
 CUSTOMER WITNESS POINT.

Reference: Specification M985; Dwg 24C362; 251156; 251864

Read and follow the M982 procedure with the Traveler. Drawing 251864 gives an overview of the position of the components 24C362 Sht 10 Detail N gives an overview of the conductor locations.

12.1 Install Item 8 the HTS-Lead Power Lead in the Feed Box. Lubricate the Threaded Rods bolts for the CF flange with vacuum grease. Torque to drawing requirements.

12.2 Perform the Peek seal pressure test. Pressurize to 10 PSI. Acceptance criteria less than 2 psi loss over 10 minutes. Complete a test report and forward to the project engineer.

12.3 Follow procedure steps 1 through 3 for the leads. (Reference 251620 for wire layout)

Wire Layout Completed: AK / DSC Date: _____

Confirmed Correct: AK / DSC Date: _____

12.4 Follow procedure steps 4 through 11.

Postion: 6 Serial No. 11
 Completed By: DSC Date: _____

12.5 Repeat for the remaining 5 Leads.

Postion: 5 Serial No. 37
 Completed By: AK Date: _____
 Postion: 34 Serial No. 34

Production Floor Traveler



Job Order 00918-0029

Part Number **DFBX-H 24C362 FB Assy** Revision **NS** U / M EA Quantity **1.00**
 Due Date **06/14/2005** Sales Order Coordinator **ECB** Ship Item **Y** Ship Early **Y** Split Ship **Y**
 Calc Rel Date **05/17/2005** Sales Order **000750** Customer **Lawrence Berkeley National Lab**
 Actual Rel Date **04/28/2005**

Description	Operation	Work Center	Operation Quantity	Setup Time	Pieces per Hour	Operation Time	Move Time	Elapsed Time
DFBX-H 24C362 Feed Box Assembly								

Completed By: D. N. Date: _____
 Position: 3 Serial No. 33
 Completed By: A. N. Date: _____
 Position: 2 Serial No. 36
 Completed By: _____ Date: _____
 Position: 2 Serial No. 38
 Completed By: B. K. Date: _____

12.6 Perform the HiPot Electrical Performance Test per the Procedure. Make sure that the free ends of the Voltage Tap wires are not grounded. TAPE OFF THE AREA AND PUT UP HIGH VOLTAGE SIGNS. INFORM THE AREA SUPERVISOR THAT THE TEST IS TAKING PLACE. Complete the test per the procedure for each HTS Power Leads.

Print out hipot test (in air) results and forward to project engineer.

Completed By: D. N. Date: _____

12.7 Stage to OP130



130 AS 1.00 0.00 0.03 30.00 0.00 30.00
 3-A ASSEMBLY

Operation Description Detail :

13.0 Dwg 24C362 H Feed Box Assembly

Forward test reports to the project engineer.
13.1 Clean the interior of the LHe Tank for cryogenic service.
13.2 Install Item 9 25I162 LHe Diagnostic Assembly.

² Record the Serial No. _____

13.3 Re-conform the continuity of all Power Lead splices.
13.4 Re-confirm the continuity of all Voltage Taps for all Power Leads.
13.5 Stage to OP140.

Completed: D. N. -By: _____

Production Floor Traveler



Job Order 00918-0029

Part Number DFBX-H 24C362 FB Assy Revision NS U / M EA Quantity 1.00
 Due Date 06/14/2005 Sales Order Coordinator ECB Ship Item Y Ship Early Y Split Ship Y
 Calc Rel Date 05/17/2005 Sales Order 000750 Customer Lawrence Berkeley National Lab
 Actual Rel Date 04/28/2005

Description	Operation	Work Center	Operation Quantity	Setup Time	Pieces per Hour	Operation Time	Move Time	Elapsed Time
DFBX-H 24C362 Feed Box Assembly								



140 AS 1.00 0.00 0.13 8.00 0.00 8.00
 3-A ASSEMBLY

Operation Description Detail :

14.0 Dwg 24C362 H Feed Box Assembly-251573 LHe Vessel

STAMP YOUR WELDS. GTAW-SS/LT root passes/FCAW-SS/LT covers.

14.1 Fit Item 32 and Item 33 Cover Plates to the LHe Tank. Reference 24C362 Sht 5 for weld details.

14.2 Root pass both Cover Plates.

14.3 Dye penetrant test the root pass of the Cover Plates. Forward test report to project engineer.

Completed By: J.J. Date: 8/22/05

14.4 Complete the Cover Plate welding.

14.5 Dye penetrant test the cover pass of the Cover Plates. Forward test report to project engineer.

Completed By: J. MAUNDER Date: 8-23-05

14.6 Stage to OP150.



150 WE 1.00 0.00 0.08 12.00 0.00 12.00
 2-A WELDERS

Operation Description Detail :

15.0 24C362 H Feed Box Assembly-Dwg 251573 LHe Tank

Forward test reports to the project engineer.

15.1 Cold shock per MTM-MP-1040 the new welds from OP150 and OP160.

Complete a test report and forward to the project engineer.

Completed by: J. MAUNDER Date: 8-23-05

15.2 Secure the Bus Ducts and LD3 pipes and the LHe Tank for pressure test. Constrain the system to protect all bellows.

15.3 Check lead chimney straightness and bellows offsets. Complete inspection report.

Requirements: Lead chimney bellows offsets < 1mm

PASS/FAIL Completed by: DJC Date: _____

15.4 Photograph the lead chimney bellows, chimneys and helium vessel. Forward disk with photos to project engineer.

Completed by: D.K. Date: _____

15.5 Stage to OP160.

Production Floor Traveler



Job Order 00918-0029

Part Number DFBX-H 24C362 FB Assy Revision NS U / M EA Quantity 1.00
 Due Date 06/14/2005 Sales Order Coordinator ECB Ship Item Y Ship Early Y Split Ship y
 Calc Rel Date 05/17/2005 Sales Order 000750 Customer Lawrence Berkeley National Lab
 Actual Rel Date 04/28/2005

Description	Operation	Work Center	Operation Quantity	Setup Time	Pieces per Hour	Operation Time	Move Time	Elapsed Time
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160 WE 1.00 0.00 0.25 4.00 0.00 4.00
 2-A WELDERS

Operation Description Detail :

16.0 24C362 H Feed Box Assembly-Dwg 25I573 LHe Tank

CUSTOMER WITNESS POINT

Forward test reports to the project engineer.

16.1 Reference Specification M989 Figure A-2. With LHe Tank at atmospheric pressure. Perform Bus Ducts pressure test to (364psig) hold for for 10 minutes.

16.2 Reference Specification M989 Figure A-2.Pressure Test LHe Tank and Bus Ducts together at (63.6 psig) for 10 minutes.

16.3 Reference Specification M989 Figure A-3. Leak test to MTM-MP-1110 the LHe Vessel and Bus Duct Assembly. (Acceptance criteria 3x10-9 atm-cc/sec of helium). BACKFILL WITH HELIUM GAS.

16.4 Stage to OP170.



170 AS 1.00 0.00 0.25 4.00 0.00 4.00
 3-A ASSEMBLY

Operation Description Detail :

17.0 24C362 H Feed Box Assembly

CUSTOMER WITNESS POINT

Forward test reports to the project engineer.

17.1 LHe Tank/Bus Duct Assembly: Reference Appendix Figure A-4 with the LHe Tank/Bus Duct Assembly backfilled with helium gas at atmospheric pressure. Perform the following HiPot Tests.

TAPE OFF THE AREA AND PUT UP HIGH VOLTAGE SIGNS.

INFORM THE AREA SUPERVISOR THAT THE TEST IS TAKING PLACE.

17.1.1 600 AMP 2 Wire Leads (0.65 kV, I<7 microamp)

17.1.2 600 AMP 6 Wire Leads (0.65 kV, I<7 microamp)

17.1.3 120 AMP 10 Wire Leads (0.65 kV, I<7 microamp)

17.1.4 HTS Leads (1.4kV, I<15 microamp)

17.2 Print out the results and forward to the project engineer.

17.3 LQX (Porcupine) Instrumentation Line: With the Instrumentation Line back filled with helium gas at atmospheric pressure, perform the following Hipot Tests.

Production Floor Traveler



Job Order 00918-0029

Part Number **DFBX-H 24C362 FB Assy** Revision **NS** U / M **EA** Quantity **1.00**
 Due Date **06/14/2005** Sales Order Coordinator **ECB** Ship Item **Y** Ship Early **Y** Split Ship **Y**
 Calc Rel Date **05/17/2005** Sales Order **000750** Customer **Lawrence Berkeley National Lab**
 Actual Rel Date **04/28/2005**

Description	Operation	Work Center	Operation Quantity	Setup Time	Pieces per Hour	Operation Time	Move Time	Elapsed Time
DFBX-H 24C362 Feed Box Assembly								

- 17.3.1 Voltage Taps (1.4kV, I<15 micro amps)
- 17.3.2 Quench Protection Heaters (1.4kV, I<15 micro amps)
- 17.3.3 Warm up Heaters (0.65 kV, I<7 micro amps)
- 17.3.4 Cold Mass Thermometers (200V, I<2 micro amps)

17.4 Print out the results and forward to the project engineer.

17.5 MBX2 Instrumentation Line: With the Instrumentation Line back filled with helium gas at atmospheric pressure, perform the following Hipot Tests.

- 17.3.1 Voltage Taps (1.4kV, I<15 micro amps)
- 17.3.2 Quench Protection Heaters (1.4kV, I<15 micro amps)
- 17.3.3 Warm up Heaters (0.65 kV, I<7 micro amps)
- 17.3.4 Cold Mass Thermometers (200V, I<2 micro amps)

17.6 Print out the results and forward to the project engineer.

17.7 Stage to OP180.



180 AS	1.00	0.00	0.07	14.00	0.00	14.00
3-A ASSEMBLY						

Operation Description Detail :

18.0 24C362 H Feed Box Assembly-Jumper Assembly JC1

18.1 Reference 24C362 Section B-B: Insulate the pipe assemblies coming out of JC1 with a 10 layer MLI blanket surrounding the pipes.

18.2 Install the 25I193 Thermal Shield Jumper Assembly over the pipe assemblies. GTAW-CU weld the clam shell halves.

18.3 Insulate the Thermal Shield Jumper Assembly with a 30 layer MLI blanket.

18.4 Fit the 25I168 Enclosure Jumper Clamshells over the Shield Jumper. (Use backing strips at seams.) Protect the MLI during welding. Weld seams.

18.5 Fit 25I168-3 Flange to Enclosure Jumper. Confirm location and parallelism/perpendicularity of flange per Section B-B. Protect the MLI during welding. Weld Flange complete.

18.6 Confirm location and parallelism/perpendicularity of flange per Section B-B. Forward inspection report to project engineer.

Confirmed by: DJC Date: _____

18.7 Stage to OP190.

Production Floor Traveler



Job Order 00918-0029

Part Number DFBX-H 24C362 FB Assy Revision NS U / M EA Quantity 1.00
 Due Date 06/14/2005 Sales Order Coordinator ECB Ship Item Y Ship Early Y Split Ship Y
 Calc Ref Date 05/17/2005 Sales Order 000750 Customer Lawrence Berkeley National Lab
 Actual Rel Date 04/28/2005

Description	Operation	Work Center	Operation Quantity	Setup Time	Pieces per Hour	Operation Time	Move Time	Elapsed Time
DFBX-H 24C362 Feed Box Assembly								



190 AS 1.00 0.00 0.13 8.00 0.00 8.00
 3-A ASSEMBLY

Operation Description Detail :

19.0 24C362 H Feed Box Assembly-Jumper Assembly JC2

- 19.1 Reference 24C362 Section K-K: Insulate the pipe assemblies coming out of JC2 with a 10 layer MLI blanket surrounding the pipes.
- 19.2 Install the 251194 Thermal Shield Jumper Assembly over the pipe assemblies. GTAW-CU weld the clam shell halves.
- 19.3 Insulate the Thermal Shield Jumper Assembly with a 30 layer MLI blanket.
- 19.4 Fit the 251167 Enclosure Jumper Clamshells over the Shield Jumper. (Use backing strips at seams.) Protect the MLI during welding. Weld seams.
- 19.5 Fit 251167-3 Flange to Enclosure Jumper. Confirm location and parallelism/perpendicularity of flange per Section K-K. Protect the MLI during welding. Weld Flange complete.
- 19.6 Confirm location and parallelism/perpendicularity of flange per Section K-K.
- * Forward inspection report to project engineer.
- Confirmed by: DJC Date: _____
- 19.7 Stage to OP200.



200 AS 1.00 0.00 0.05 20.00 0.00 20.00
 3-A ASSEMBLY

Operation Description Detail :

20.0 24C362 H Feed Box Assembly-Dwg 251573 LHe Tank

CUSTOMER WITNESS POINT

- 20.1 Insulate the LHe Tank, Lead Chimneys, LD3 and Bus Duct Pipes with 10 layers of MLI. Reference Specification M-990. NOTE: In locations where pipes pass through support assemblies the insulation is to be wrapped with kapton tape for protection from abrasion during thermal cycling.
- 20.2 Insulate with MLI all pipes within the thermal shield with 10 layers of MLI and outside the thermal shield with 30 layers MLI per Specification M-990 6.7b prior.
- 20.3 Stage to OP210.



210 AS 1.00 0.00 0.03 32.00 0.00 32.00
 3-A ASSEMBLY

Operation Description Detail :

21.0 24C362 H Feed Box Assembly-

- 21.1 Confirm the minimum clearance from any pipe to any other is ≥ 12 mm (.47").

Production Floor Traveler



Job Order 00918-0029

Part Number **DFBX-H 24C362 FB Assy** Revision **NS** U / M **EA** Quantity **1.00**
 Due Date **06/14/2005** Sales Order Coordinator **ECB** Ship Item **Y** Ship Early **Y** Split Ship **Y**
 Calc Rel Date **05/17/2005** Sales Order **000750** Customer **Lawrence Berkeley National Lab**
 Actual Rel Date **04/28/2005**

Operation	Work Center	Operation Quantity	Setup Time	Pieces per Hour	Operation Time	Move Time	Elapsed Time
Description	DFBX-H 24C362 Feed Box Assembly						

Document piping assembly with photos. Forward disk to project engineer.

Confirmed by J. K. Date: _____

21.2 Stage to OP220.



220 AS 1.00 0.00 0.07 14.00 0.00 14.00
3-A ASSEMBLY

Operation Description Detail :

22.0 24C362 H Feed Box Assembly

- 22.1 Install the copper thermal intercept block assembly (provided by Fermilab) to the MQX2 line.**
- 22.2 Install the copper thermal intercept block assembly (provided by Fermilab) to the MBX2 line.**
- 22.3 Solder the thermal straps to the shield.**
- 22.4 Stage to OP240.**



230 WE 1.00 0.00 0.10 10.00 0.00 10.00
2-A WELDERS

Operation Description Detail :

23.0 24C362 H Feed Box Assembly

- 23.1 Pull 25I858 Base Plate Assy kit. Pull the 25I079 Thermal Shield Assy kit.**
- 23.2 Reference 25I858. Assemble the 4x-Stantions to the Bottom Plate. Tack weld the nuts. Insulate the stantions to prevent shine thru.**
- 23.3 Reference 25I079. Pre-assembly the Thermal Shield. Reference Pipe, EX. Install the Pipe, EX assembly to the Shield assembly, positioning location to 24C362. Rivet and solder the thermal straps to the shield to hold them in place.**
- 23.4 Assemble the Thermal Shield Assembly and Baseplate Assemble together.**
- 23.5 Install the assembly under the LHe Tank. Position the Bottom Plate correctly in relation to the Feed Box Assy. Feed the two 25I858-1 Support Rods through the Stantions and the LHe Tank brackets. Install the hex nuts and loosely position everything. Don't tighten the fasteners and nuts on the Support Rods until after fit up of the Vacuum Vessel Sides.**
- 23.6 Assemble the 2x Shield Access Covers to the Shield Assy.**
- 23.7 Reference 25I235 Pipe, EX. Complete the EX line where it had to be cut apart to allow assembly. Cold shock the new welds, pressure test and leak test the EX line. Forward the test reports to the project engineer.**
- 23.8 Stage to OP230.**

Production Floor Traveler



Job Order 00918-0029

Part Number **DFBX-H 24C362 FB Assy** Revision **NS** U / M EA Quantity **1.00**
 Due Date **06/14/2005** Sales Order Coordinator **ECB** Ship Item **Y** Ship Early **Y** Split Ship **Y**
 Calc Ref Date **05/17/2005** Sales Order **000750** Customer **Lawrence Berkeley National Lab**
 Actual Ref Date **04/28/2005**

Description	Operation	Work Center	Operation Quantity	Setup Time	Pieces per Hour	Operation Time	Move Time	Elapsed Time
DFBX-H 24C362 Feed Box Assembly								



240	WE	1.00	0.00	0.03	30.00	0.00	30.00
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2-A WELDERS

Operation Description Detail :

24.0 24C362 H Feed Box Assembly

24.1 Reference Specification M990. Insulate the Thermal Shield with 30 layers of MLI.

24.2 Stage to OP250



250	WE	1.00	0.00	1.00	1.00	0.00	1.00
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2-A WELDERS

Operation Description Detail :

25.0 24C362 H Feed Box Assembly

CUSTOMER WITNESS POINT

STAMP YOUR WELDS

25.1 Fit the Side Plate Cover (251125) into Vacuum Vessel Side (251123), tack in place.

25.2 Fit the two Sides Plates (251123, 251160) of the Feed Box Vacuum Vessel to the Vacuum Vessel Top Plate and Bottom Plate.

25.3 Use the 251858 Support Rods and adjust and position the LHe Tank and Shield Assembly within the Vacuum Vessel. Tighten the fasteners. Insulate over the access points, 30 layers MLI.

25.4 Fit up the End Plates onto the Vacuum Vessel Assembly.

25.5 Break the tack welds on the Lead Chimney Flanges. Loosen the HTS Lead threaded rods.

25.6 Set up machinist indicators of the assembly frame on the Top Plate and Sides to monitor movement during welding.

25.7 Purge the Vacuum Vessel. Set up the O2 analyzer and purge the Vacuum Vessel with pure Argon gas off a dewar.

25.8 GTAW-SS/LT, tig weld only to seal all around. Use two welders working together. Sequence welding to limit heating of vessel and cause opposing distortions.

25.9 Continuously monitor movement. Review results upon completion of seal pass.

25.10 FCAW-SS/LT. Use two welders working together. Sequence welding to limit heating of vessel and to cause opposing distortions.

25.11 Continuously monitor movement.

25.12 Fit and weld the Dwg 251139 Item 1 Jack Pads (1x) and Item 5 Mounting Pads (4x) and the Dwg 251133 Item 4 Jack Pads (2x) and Item 5 Mounting Pads (4x).

25.13 Major Welding Completed

Production Floor Traveler



Job Order 00918-0029

Part Number DFBX-H 24C362 FB Assy Revision NS U / M EA Quantity 1.00
 Due Date 06/14/2005 Sales Order Coordinator ECB Ship Item Y Ship Early Y Split Ship Y
 Calc Rel Date 05/17/2005 Sales Order 000750 Customer Lawrence Berkeley National Lab
 Actual Rel Date 04/28/2005

Description	Operation	Work Center	Operation Quantity	Setup Time	Pieces per Hour	Operation Time	Move Time	Elapsed Time
DFBX-H 24C362 Feed Box Assembly								

Weld Inspection: TKK Date: _____

Top Plate Distortion Review:
 By: [Signature] Date: _____

- 25.14 Weld the Lead Chimney Flanges complete (GTAW-SS/LT).
- 25.15 Fit 251129-4 Q3 Flange to Vessel.
- 25.16 Fit 251133-2 D1 Flange to Vessel.
- 25.17 Check dimensional requirements per Sheet 4 Section D-D. Request assistance from Assembly to check dimensions to JC1 Jumper Flange.
- 25.18 Weld flanges complete.



260 WE 1.00 0.00 0.06 16.00 0.00 16.00
 2-A WELDERS

Operation Description Detail :

- 26.0 24C362 H Feed Box Assembly
 - Install the following remaining subassemblies to the Top Plate.
 - 26.1 251171 DH Relief Valve Assembly
 - 26.2 251868 2x-Tooling Balls
 - 26.3 25M820 Alignment Plate (Tack weld in place, see 24C352 sheet 11)
 - 26.4 251339 Helium Port Relief Valve Assembly
 - 26.5 251910 Rough Port Assembly
 - 26.6 24C352-28 4x-Hoist Rings
 - 26.7 Assemble 3x-251166 Thrust Load Bumpers. Package for shipment.
 - 26.8 Package with 26.7 above 4x 251179 Brackets.
 - 26.9 Stage to subjob-0005.

Total Times - 0.00 302.00 0.00 302.00

End Of Report

* Represents Sub-Contract days, these days are not included in the column total.