



1. Scope:

This specification describes the procedure used to produce DESY GG Cryostat Assemblies.

2. Applicable Documents:

DESY-MAG-R-4010 Combined Element Magnet Assembly Pressure Leak Check  
RHIC-MAG-Q-1000 Control of Measurement Test Equipment  
RHIC-MAG-Q-1004 Discrepancy Reporting Procedure

3. Requirements:

3.1 Material /Equipment:

N/A

3.2 Safety Precautions:

3.2.1 Operators shall wear safety glasses with side shields, or goggles.

3.2.2 Operators shall be trained by their cognizant technical supervisor and qualified in the operation of the required welding equipment.

3.2.3 No welding shall take place unless all welding screens are in place around the welding station, and all personnel not directly involved with the welding process are outside the screens. Any personnel inside the screens shall wear protective gear to prevent eye injury, and shall be clothed to prevent burns caused by intense ultra-violet light.

3.2.4 All lifting and handling operation requiring overhead crane operations shall be performed by holders of valid Safety Awareness Certificates and trained in the use of the lifting device by the Cognizant Engineer or Technical Supervisor.

3.2.5 All relief devices and gauges used for pressure tests shall meet the requirements of ES&H Standard 1.4.1.

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- 3.3 Procedure
- 3.3.1 Disassemble and clean cryostat and helium containment tubes.
- 3.3.2 Weld 15020072 (4k internal flex hose assembly) in position on the coil assembly.
- 3.3.3 Route stabilized leads through 15020072 hose assembly.
- 3.3.4 Cover exiting lead at the end flange with .015 NOMEX and secure down around support tube with KEVLAR cord and epoxy.
- 3.3.5 Tack weld backing strip to inside of lead end flange.
- 3.3.6 Weld containment tube to coil assembly (tool needed to index key slots to drive pin on coil end flange).
- 3.3.7 Starting from L.E. insert beam tube assembly through coil support tube insert so that beam tube protrudes 6" past NLE of coil support assembly.
- 3.3.8 Weld in 15020319 (u-bend pipe) between beam tube cooling lines.
- 3.3.9 Rotate 4K inlet line as far as possible until elbow faces up. (This adds clearance for weld).
- 3.3.10 Weld 15020316 & 15020317 (4k inlet pipes) together.
- 3.3.11 Push beam tube back into proper position.
- 3.3.12 Weld 4K inlet assembly to manifold flange.
- 3.3.13 Weld 15020295 (beam tube adapter flange) to the NLE of the beam tube.
- 3.3.14 Weld 15020081 NLE beam tube bellows sub assembly in place.
- 3.3.15 Slide cryostat tube over cold mass assembly and temporarily install retaining keys.
- 3.3.16 Slide 15020022 rear plate into position on cryostat tube.
- 3.3.17 Install alignment tool to cold mass, cryostat and rear plate.
- 3.3.18 Tack weld rear plate to cryostat tube.

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- 3.3.19 Remove alignment tool and finish weld rear plate to cryostat tube.
- 3.3.20 Remove keys and cryostat assembly from cold mass.
- 3.3.21 Weld 15020077 /15020078 (flex hose assemblies) to pipe ends on the lead end.
- 3.3.22 Weld 15010139 extension tube and rotatable flange assembly onto end of 40k exit.
- 3.3.23 Weld 15020292 (beam tube adapter flange) to the lead end of the beam tube.
- 3.3.24 Install 15020021 front plate assembly to 15020080 L.E beam tube bellows sub assembly.
- 3.3.25 Install 15020086 axial restraint and 15020063 wiring box mount to cold mass assembly.
- 3.3.26 Install 15010059 support posts to front plate.
- 3.3.27 Weld front plate and bellows assembly to bellows attachment flange.
- 3.3.28 Position 15020061 wiring box assembly and 15020076 40K return line in the front plate.
- 3.3.29 Mount wiring box and route leads from 15020072 hose assembly and connect 15020072 assembly to wiring box.
- 3.3.30 Install 15020058 support posts to rear plate.
- 3.3.31 Connect 15020076 40k return hose assembly to extension tube and flange.
- 3.3.32 Again, temporarily install cryostat assembly and retaining keys in place.

#### **NOTE**

**At this time, hold retaining keys in place with a hose clamp.**

- 3.3.33 Blank off 4k & 40k returns.
- 3.3.34 Install 15020062 wiring box cover.
- 3.3.35 Temporarily install 15020020 end volume housing.

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- 3.3.36 Pressure leak check assembly in accordance with DESY-MAG-R-4010.
- 3.3.37 Remove end volume housing and cryostat assembly.
- 3.3.38 Superinsulate cold mass assembly.
- 3.3.39 Starting from NLE slide cryostat tube into position over cold mass.
- 3.3.40 Position and weld retaining keys in place.
- 3.3.41 Mount axial restraint to rear plate.
- 3.3.42 Weld I.P. flange to cryostat tube.
- 4. Quality Assurance Provisions:
  - 4.1 The Quality Assurance provisions of this procedure require that the technician shall be responsible for performing all assembly operations in compliance with the procedural instructions contained herein and the recording of the results on the production traveler.
  - 4.2 The technician is responsible for notifying the technical supervisor and/or the cognizant engineer of any discrepancies occurring during the performance of this procedure. All discrepancies shall be identified and reported in accordance with RHIC- MAG-Q-1004.
  - 4.3 Measuring and test equipment used for this procedure shall contain a valid calibration label in accordance with RHIC-MAG-Q-1000.
- 5. Preparation for Delivery:

N/A