



LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY

LIGO Laboratory / LIGO Scientific Collaboration

LIGO-E1400011-v2

LIGO

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ISC Beam Diverters: Acceptance Documentation

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1 Requirements documentation

There is no separate requirements document for the Beam Diverter; see design document for a statement of what the device is intended to do (Introduction of [LIGO-T1100252](#)).

2 Design overview and detailed design documentation

Design documentation is in the aLIGO DCC tree, starting at:

[LIGO-E1200835](#): aLIGO, ISC, In-Vacuum Beam Diverter

a) *Final Design Document (FDD)*: [LIGO-T1100252](#)

b) *Review reports*:

The beam diverter design we ended up with was not reviewed (oversight). An earlier version based on a linear motor was reviewed (review report is T1000413); however, we abandoned this design during prototyping, and changed to the rotor design.

c) *Supporting design documents: models, analyses, specifications, etc.*

None.

d) *Drawings: cite the top level assembly drawing for each major assembly or subsystem.*

[LIGO-D1100642](#)

e) *Bill(s) of Materials (BOM): cite any collected BOMs. If the BOMs are only to be found on the Assembly and Sub-Assembly drawing sheets, then state so.*

BOMs are found in the assembly drawings.

f) *Interface control: cite any documents (such as RODAs) with interface definition/control and/or cite the relevant sections of the DRD and FDD.*

None.

g) *Software: cite any software design description documentation.*

TwinCat library: [LIGO-E1300124](#)

h) *Design source data:*

- *Confirm that all mechanical design CAD models are in the SolidWorks/PDMWorks vault, or explain what is not and why.*

- *Confirm that all electronics design CAD models (schematics and PWB layouts) are backed up and available on LIGO Lab archives, or explain what is not and why.*

Confirmed.

3 Materials and fabrication specification

Any special materials, or treatment of materials including preparation for in-vacuum use; this may be integrated into the Design documentation.

Reed switches are vacuum encapsulated, hermetic sealed units. All other materials are standard vacuum materials.

4 Parts and in-process spares inventoried

All Beam Diverter assemblies are in ICS as assembly records: ASSY-D1100642-Snn. There are 19 assembled units, including one first article that has some minor differences from the others. Each interferometer requires 6 units (2 for the TransMonitors, 2 in HAM1, 2 in HAM6). Spare parts also exist and are in ICS.

5 Assembly procedures

Assembly procedure: [LIGO-E1100686](#)

6 Installation procedures

No installation procedures are required.

7 Test documents

A rig for testing beam diverter functionality was produced:

[LIGO-E1201078](#): aLIGO, ISC, Electronics, Beam Diverter Tester

Section 3 of the assembly procedure, [LIGO-E1100686](#), outlines the test procedure. Test results are included in ICS, as a Test Record for each unit (e.g., [TEST-ISC-11771](#)).

8 User interface software

User interface is an medm screen with an ‘Open/Closed’ toggle, and readbacks of the reed switches.

9 Operation Manual

An operations manual is not deemed to be required.

10 Safety

Safety documentation must be in the DCC for all phases of the subsystem development, including any needed for normal use or foreseen maintenance/repair scenarios.

N/A