*LIGO Laboratory / LIGO Scientific Collaboration*

LIGO-E1400011-v2 *LIGO* February 26, 2014

*ISC Beam Diverters:* Acceptance Documentation

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# 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](https://dcc.ligo.org/LIGO-T1100252)).

# Design overview and detailed design documentation

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

[LIGO-E1200835](https://dcc.ligo.org/LIGO-E1200835): aLIGO, ISC, In-Vacuum Beam Diverter

*a) Final Design Document (FDD):* [LIGO-T1100252](https://dcc.ligo.org/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](https://dcc.ligo.org/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](https://dcc.ligo.org/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.

# 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.

# 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.

# Assembly procedures

Assembly procedure: [LIGO-E1100686](https://dcc.ligo.org/LIGO-E1100686)

# Installation procedures

No installation procedures are required.

# Test documents

A rig for testing beam diverter functionality was produced:

[LIGO-E1201078](https://dcc.ligo.org/LIGO-E1201078): aLIGO, ISC, Electronics, Beam Diverter Tester

Section 3 of the assembly procedure, [LIGO-E1100686](https://dcc.ligo.org/LIGO-E1100686), outlines the test procedure. Test results are included in ICS, as a Test Record for each unit (e.g., [TEST-ISC-11771](https://ics-redux.ligo-la.caltech.edu/JIRA/browse/TEST-ISC-11771)).

# User interface software

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

# Operation Manual

An operations manual is not deemed to be required.

# 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