## 1.1 Project Scope

**Project Description**

This project aims to validate the existing design of an environmental testing chamber and deliver an assembly that monitors and regulates its internal temperature and humidity for use in a laboratory environment.

**Key Goals**

The goals of this project are to complete, validate, and implement the chamber design. These include conducting a thorough heat balance analysis, modifying, and finalizing the hardware and software, and overseeing the construction of the final product. The chamber is desired to be capable of fluctuating from conditions ranging from 10°C to 50°C and 0-95% relative humidity within 15 minutes. Other goals are that the compressor can be seen during testing and can be easily accessed. The final goal is to deliver a system capable of long-term testing of Danfoss Turbocor compressors.

**Markets**

The primary market of this project is the end-users of the environmentally controlled test chamber, Danfoss Turbocor Compressors, Inc. They will use it to test the performance of their products, benefiting the company directly. Secondary markets include any individual or company which requires the chamber for testing of their own. This would consist of other compressor manufacturers, companies that provide air-conditioned storage, ecology companies, and laboratories storing sensitive substances.

**Assumptions**

Some assumptions were made about this project to limit its scope and maintain focus on achieving the key goals. It is assumed that the design will rest on a flat test rig that rests on a level surface. There will be access to machining services and a 110V power outlet. Another presumption is that the compressor’s conductive heat is small enough to be considered negligible and hence unaccounted for. It is also assumed that the user has access to a crane capable of lifting and lowering the compressor into the test chamber. The existing support for the test chamber is assumed to have sufficient load capacity for the compressor, and the compressor’s size remains the same. These assumptions allow for concentration on the content and challenges of this project’s scope.

**Stakeholders**

The main stakeholders of this project are Danfoss Turbocor Compressors, Inc., William M. Bilbow, Mr. Larson, and Dr. McConomy. Each will contribute to the project in some capacity and benefit from the design. Another stakeholder would be an original equipment manufacturer (OEM) of compressors.